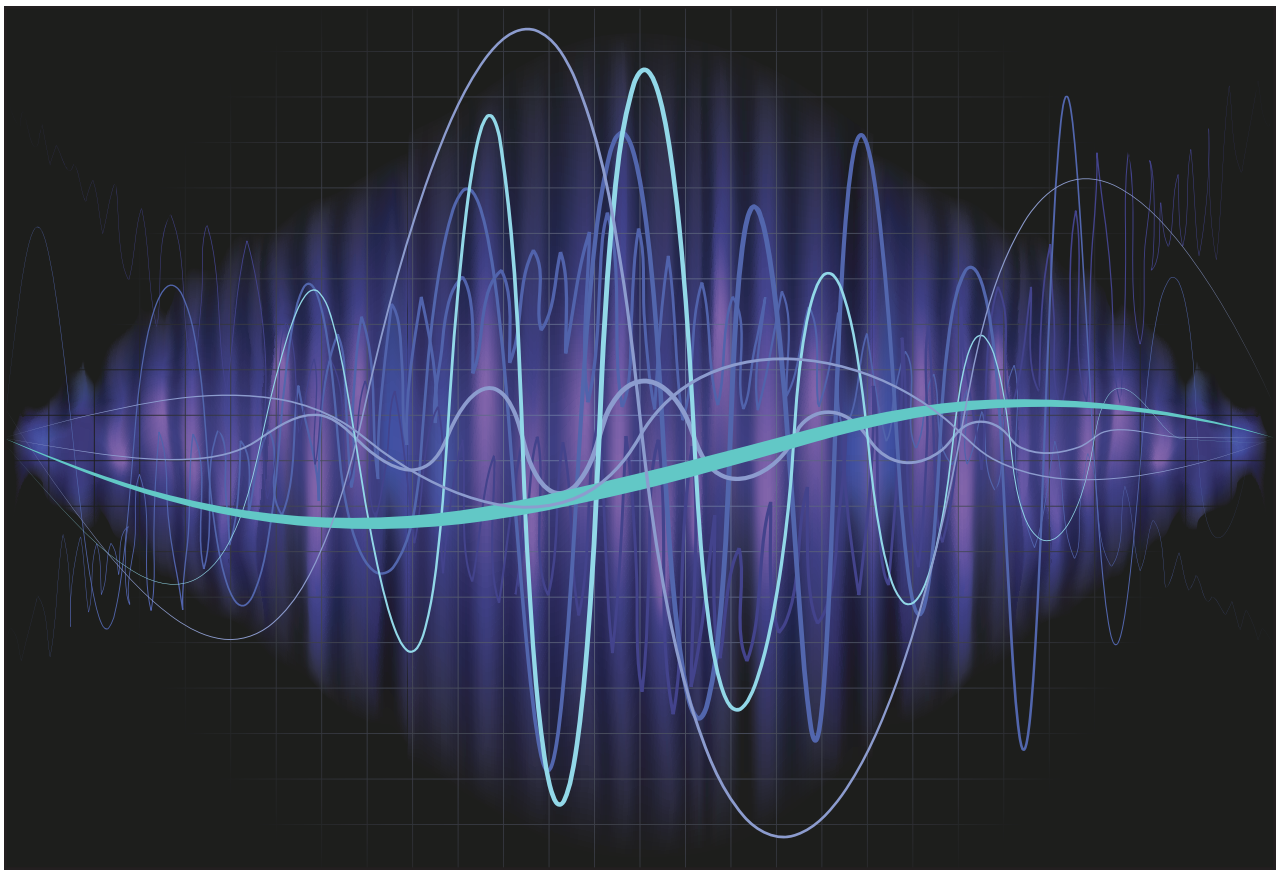
2009 Fall / Winter Issue 66

Journal of Technical Analysis



Market Technicians Association, Inc.
Professionals Managing Market Risk • Incorporated in 1973

Table of Contents

Journal Editor & Reviewers 2

Letter from the Editor 3

1 **Importance of Stupidity** 5
Martin A. Schwartz, Ph.D.

2 **Purified Sentiment Indicators for the Stock Market** 7
David R. Aronson, CMT
John R. Wolberg

3 **Does the Wave Principle Subsume all Valid Technical Chart Patterns?** 28
Robert R. Prechter Jr., CMT

4 **Using IPOs to ID Sector Opportunities** 51
Kevin Lapham, CMT

5 **Cycles: The Mysterious Forces That Trigger Events** 77
Edward R. Dewey, founder of The Foundation of the Study of Cycles,
with Og Mandino

The Organization of the Market Technicians Association, Inc. 86

Journal Editors & Reviewers

Editor

Connie Brown, CMT
Aerodynamic Investments Inc.
Campobello, South Carolina

Associate Editor

Michael Carr, CMT
Cheyenne, Wyoming

Manuscript Reviewers

Julie Dahlquist, Ph.D., CMT
University of Texas
San Antonio, Texas

J. Ronald Davis
Golum Investors, Inc.
Portland, Oregon

Cynthia Kase, CMT
Kase and Company, Inc.
Albuquerque, New Mexico

Saeid (Sid) Mokhtari, CMT
Canadian Imperial Bank of Commerce (CIBC), World Markets
Toronto, Ontario, Canada

Michael J. Moody, CMT
Dorsey, Wright & Associates
Pasadena, California

Robert R. Prechter, Jr., CMT
Elliott Wave International
Gainesville, Georgia

Marketing Director

Timothy Licitra
Marketing Services Coordinator
Market Technicians Association, Inc.

Publisher

Market Technicians Association, Inc.
61 Broadway, Suite 514
New York, New York 10006
646-652-3300
www.mta.org

Journal of Technical Analysis is published by the Market Technicians Association, Inc., (MTA) 61 Broadway, Suite 514, New York, NY 10006. Its purpose is to promote the investigation and analysis of the price and volume activities of the world's financial markets. *Journal of Technical Analysis* is distributed to individuals (both academic and practitioner) and libraries in the United States, Canada and several other countries in Europe and Asia. *Journal of Technical Analysis* is copyrighted by the Market Technicians Association and registered with the Library of Congress. All rights are reserved.

Letter from the Editor

For decades I carried a quote in my wallet from Albert Einstein that goes something like this:

> As one grows older, one sees the impossibility of imposing one's will on the chaos with brute force. But if you are patient, there will come that moment in time, when while eating an apple, the solution will present itself politely and say, "Here I am."

We most certainly live in a historic period that many describe as chaotic, but experienced technical analysts around the world reflect in private moments and say "Here we are – again." The solutions we obtain from our charts come most often in quiet moments only after years of preparation, exhaustive research, and at least a decade of experience. It is this combination that creates an inner calm, allowing solutions to present themselves politely when so many people are in a state of panic and lacking clarity.

I believe this issue of the *Journal of Technical Analysis* will provide insight to many readers about the depth of commitment the authors needed to obtain confidence in the methodologies they employ. This is an exceptional issue showing diversity and depth that will add to our understanding and will serve to guide us all on how best to present our own research summaries.

Who will be motivated by this Journal to accept the challenge described at the end of my letter?

The MTA *Journal of Technical Analysis* announced changes in our manuscript review board this year. What does the review board actually do for you? To quote one author whose paper was not accepted, 'This kind of feedback is invaluable.' There is more to the review process than you may be aware. While we have an important role to accept papers that reflect the highest standards within our industry, we also strive to further encourage and guide aspiring authors with very detailed comments to further the development of their work.

After many years of service Ken Tower, CMT has stepped down to serve the MTA by pursuing other responsibilities that are very time demanding. Ken has always been very active and helped guide the Journal to the high standards it represents today. He was a valued reviewer because of his extensive experience and knowledge about chart analysis. I would also like to thank Philip McDonnell for his past contributions that helped this Journal gain acceptance and recognition within the academic community and thereby helped us all.

Robert R. Prechter, Jr. CMT, founder of Elliott Wave International in Gainesville, Georgia has graciously accepted the important role of Manuscript Reviewer for our Journal. He is highly respected and a tremendous addition to our review committee because of his field of expertise. The Journal represents all methods of technical analysis including market psychology, geometry, and the Elliott Wave Principle. These disciplines do not always fit easily into a paper directed toward statistical outcomes and I felt we needed a clear statement that these are important disciplines in which our Journal encourages further development and research as well as quantitative analysis. I must comment that his published paper in this issue was submitted a week after the close of last year's 2008 release. His paper was judged anonymously and accepted on its own merits. We are all held to the same standards and review process.

Our Journal is distributed throughout the academic community and to our members around the world. The Chartered Market Technician (CMT) certification is experiencing a rapid growth in all countries. As your editor I felt our review board must include the interests of our Canadian neighbors. Saeid (Sid) Mokhtari, CMT with the Canadian Imperial Bank of Commerce (CIBC), World Markets in Toronto, has also graciously accepted the position of Manuscript Reviewer. Sid Mokhtari is on the day-to-day frontlines, tracking global markets. His institutional experiences and diverse technical methods are great assets to our review process.

Let me conclude with a challenge for you. Our historic reprint connects the cycle work of Samuel Benner [see Issue 65], to the extraordinary work of Edward R. Dewey who was the president of the Foundation for the Study of Cycles. All technical analysts should know the names of both these individuals. In this reprint from Mr. Dewey's book, *Cycles*, he references the work of Mr. Benner and carries his baton forward. Sadly, Dewey's charts and work ended in the mid-1950s. Who among us is willing to pick up Mr. Dewey's baton, bring his work up to date and expand our understanding? Who is willing to attempt to answer Mr. Dewey's question, 'what is the contributing cause?' Your own focus may be with other markets, but I assure you, when you study a market that is, at first glance not so close to your own, you may just find the solution presents itself politely and says, "Here I am" for your primary field of interest.

Respectfully,

Connie Brown, CMT

Submission and Style Instructions

1. All submitted manuscripts must be original work that is not under submission at another journal or under consideration for publication in another form, such as a monograph or chapter of a book. Authors of submitted papers are obligated not to submit their paper for publication elsewhere until the *Journal of Technical Analysis* renders an editorial decision on their submission. Further, authors of accepted papers are prohibited from publishing the results in other publications that appear before the paper is published in the *Journal of Technical Analysis*, unless they receive approval for doing so from the editor. Upon acceptance of the paper for publication, we maintain the right to make minor revisions or to return the manuscript to the author for major revisions.
2. Authors must submit papers electronically in Word (*.doc) format. Submit all figures (charts) in *.jpg or *.bmp to journal@mta.org. Manuscripts must be clearly typed with double spacing. The pitch must not exceed 12 characters per inch, and the character height must be at least 10 points.
3. The cover page shall contain the title of the paper and an abstract of *not* more than 100 words. The title page should not include the names of the authors, their affiliations, or any other identifying information. That information plus a short biography including educational background, professional background, special designations such as Ph.D., CMT, CFA, etc., and present position and title must be submitted on a separate page.
4. An acknowledgement footnote should *not* be included on the paper but should also be submitted on a separate page.
5. The introductory section must have no heading or number. Subsequent headings should be given Roman numerals. Subsection headings should be lettered A, B, C, etc.
6. The article should end with a non-technical summary statement of the main conclusions. Lengthy mathematical proofs and very extensive detailed tables or charts should be placed in an appendix or omitted entirely. The author should make every effort to explain the meaning of mathematical proofs.
7. *Footnotes*: Footnotes in the text must be numbered consecutively and typed on a separate page, double-spaced, following the reference section. Footnotes to tables must also be double-spaced and typed on the bottom of the page with the table.
8. *Tables*: Tables must be numbered with Roman numerals. Please check that your text contains a reference to each table. Indicate with a notation inserted in the text appropriately where each table should be placed. Type each table on a separate page at the end of the paper. Tables must be self-contained, in the sense that the reader must be able to understand them without going back to the text of the paper. Each table must have a title followed by a descriptive legend. Authors must check tables to be sure that the title, column headings, captions, etc. are clear and to the point.
9. *Figures*: Figures must be numbered with Arabic numerals. All figure captions must be typed in double space on a separate sheet following the footnotes. A figure's title should be part of the caption. Figures must be self-contained. Each figure must have a title followed by a descriptive legend. Final figures for accepted papers must be submitted as either *.jpg or *.bmp files.
10. *Equations*: All but very short mathematical expressions should be displayed on a separate line and centered. Equations must be numbered consecutively on the right margin, using Arabic numerals in parentheses. Use Greek letters only when necessary. Do not use a dot over a variable to denote time derivative; only D operator notations are acceptable.
11. *References*: References to publications in the text should appear as follows:
"Jensen and Meckling (1976) report that..."

    References must be typed on a separate page, double-spaced, in alphabetical order by the leading author's last name. At the end of the manuscript (before tables and figures), the complete list of references should be listed *in the formats that follow*:

    For monographs or books:
    Fama, Eugene F., and Merton H. Miller, 1972, The Theory of Finance (Dryden Press, Hindsdale, IL)

    For contributions to major works:
    Grossman, Sanford J., and Oliver D. Hart, 1982, Corporate financial structure and managerial incentives, in John J. McCall, ed.: The Economics of Information and Uncertainty (University of Chicago Press, Chicago, IL)

    For Periodicals:
    Jensen, Michael C., and William H. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3, 305-360

    Please note where words are CAPITALIZED, *italics are used*, (parentheses) are used, order of wording, and the position of names and their order.

The Importance of Stupidity in Scientific Research

Martin A. Schwartz, Ph.D.

1

I recently saw an old friend for the first time in many years. We had been Ph.D. students at the same time, both studying science, though in different areas. She later dropped out of graduate school, went to Harvard Law and is now a senior lawyer for a major environmental organization. At some point, the conversation turned to why she had left grad school. To my utter astonishment, she said it was because it made her feel stupid. After a couple of years of feeling stupid every day, she was ready to do something else.

I had thought of her as one of the brightest people I knew and her subsequent career supports that view. What she said bothered me. I kept thinking about it and sometime the next day, it hit me. Science makes me feel stupid too. It's just that I've gotten used to it. So used to it, in fact, that I actively seek out new opportunities to feel stupid. I wouldn't know what to do without it. I even think it's supposed to be this way. Let me explain.

For almost all of us, one of the reasons that we liked science in high school and college is that we were good at it. That can't be the only reason; fascination with understanding the physical world and an emotional need to discover new things has to enter into it too. But high school and college science means taking courses, and doing well in courses means getting the right answers on tests. The framework is one in which there are right answers and, if you know those answers, you do well and get to feel smart.

A Ph.D. where you have to do a research project is a whole different thing. For me, it was a daunting task. How could I possibly frame the questions that would lead to significant discoveries; to design and interpret an experiment so that the conclusions were absolutely convincing; to foresee difficulties and see ways around them, or, failing that, to solve them when they occurred? My Ph.D. project was somewhat interdisciplinary and, for a while, whenever I ran into a problem, I used to pester the various faculty in my department who were experts in the various disciplines that I needed. I remember the day when Henry Taube (who won the Nobel Prize 2 years later) told me he didn't know how to solve the problem I was having in his area. I was a 3rd year grad student and I figured that Taube knew about 1000 times more than I did (conservative estimate). If he didn't have the answer, nobody did.

That's when it hit me: nobody did. That's why it was a research problem. And being my research problem, it was up to me to solve. Once I faced that fact, I solved the problem in a couple of days. (It wasn't really very hard; I just had to try a few things). The critical lesson was that the scope of things I didn't know wasn't merely vast, it was for all practical purposes infinite. That realization, instead of being discouraging, was liberating. If our ignorance is infinite, the only possible course of action is to muddle through as best we can.

I'd like to suggest that our Ph.D. programs often do students a disservice in two ways. First, I don't think students are made to understand how hard it is to do research. And how very, very hard it is to do important research. It's a lot harder than taking even very demanding courses. What makes it difficult is that research is immersion in the unknown. We just don't know what we're doing. We can't be sure if we're asking the right question or doing the right experiment till we get the answer or the result. Admittedly, science is made harder by competition for grants and space in top journals. But apart from all of that, doing significant research is intrinsically hard and changing departmental, institutional or national policies will not succeed in lessening its intrinsic difficulty.

The second point is that we don't do a good enough job of teaching our students how to be productively stupid. That if we don't feel stupid it means we're not really trying. I'm not talking about "relative stupidity", where the other students in the class actually read the material, think about it, and ace the exam, while you don't. I'm also not talking about bright people who might be working in areas that don't match their talents. Science involves confronting our "absolute stupidity". That kind of stupidity is an existential fact, inherent in our efforts to push our way into the unknown. Preliminary and thesis exams have the right idea when the faculty committee pushes until the student starts getting the answers wrong or gives up and says I don't know. The point of the exam isn't to see if the student gets all the answers right. If they do, it's the faculty who failed the exam. The point is to identify the student's weaknesses. Partly to see where they need to invest some effort and partly to see whether the student's knowledge fails at a sufficiently high level that they are ready to take on a research project.

Productive stupidity means being ignorant by choice. Focusing on important questions puts us in the awkward position of being ignorant. One of the beautiful things about science is that it allows us to bumble along, getting it wrong time after time, and feeling perfectly fine as long as we learn something each time. No doubt, this can be difficult for students accustomed to getting the answers right. No doubt, reasonable levels of confidence and emotional resilience help. But I think scientific education might do more to ease what is a very big transition: from learning what other people once discovered to making your own discoveries. The more comfortable we become with being stupid, the deeper we will wade into the unknown, the more likely we are to make big discoveries.

About the Author

Martin A. Schwartz, Ph.D.
Department of Microbiology
University of Virginia
Reprinted with permission of the author
First published in the Journal of Cell Science 121, Essay 1771, 2008

Purified Sentiment Indicators for the Stock Market

David R. Aronson, CMT
John R. Wolberg

2

Abstract

We attempt to improve the stationarity and predictive power of stock market sentiment indicators (SI) by removing the influence of the market's recent price dynamics (velocity, acceleration & volatility). We call the result a purified sentiment indicator (PSI). PSI is derived with an adaptive regression model employing price dynamics indicators to predict SI. PSI is the difference between observed SI and predicted SI normalized by model error. We produce PSI for the following SI: CBOE Implied Volatility Index (VIX), CBOE Equity Put to Call Ratio (PCR), American Association of Individual Investors Bulls minus Bears (AAII), Investors Intelligence Bulls minus and Bears (INV) and Hulbert's Stock Newsletter Sentiment Index (HUL). All SI series are predictable from price dynamics (r-squares range from .25 to .70). Using cross-validation we derive a signaling rule for each SI, PSI, and price dynamics indicator and compare them with a random signal in terms of their out-of-sample profit factor (PF) trading the SP500. Purification generally improves the stationarity of SI by reducing drift and stabilizing variability. However, it generally reduces PF for PCR, AAII, INV and HUL suggesting at least some of their predictive power stems from price dynamics. In contrast, PF of VIX is significantly enhanced by purification implying it contains predictive information above and beyond price dynamics but which is masked by price dynamics. Purified VIX is superior to all other indicators tested.

I. Background

A. Sentiment Indicators

Technical analysts use SI to gauge the expectations of various groups of market participants, predict market trends and generate buy & sell signals under the assumption that they carry information that is not redundant of price indicators. SI are interpreted on the basis of *Contrary Opinion Theory* which suggests that if investors become too extreme in their expectations, the market will subsequently move opposite to the expectation. Thus, extreme levels of optimism (pessimism) should precede market declines (advances).

There are of two types of SI: direct and indirect. Direct indicators poll investors in a particular group, such as individual investors (AAII) or writers of newsletters (INV & HUL) about their market expectations. Indirect indicators (PCR &VIX) infer the expectations of investors in a particular group by analyzing market statistics that reflect the group's behavior. For example, put and call option volumes reflect the behavior of option traders. Thus an abnormally high ratio of put to call volume would imply options traders expect the market to decline.

B. Prior Research

Influence of Market Dynamics

Our study is motivated by three areas of prior research: (1) influence of market dynamics on sentiment indicators, (2) predictive power of sentiment indicators and (3) use of regression analysis to purge indicators of unwanted effects in an effort to boost their predictive power.

With respect to (1), intuition alone would suggest that sentiment should be influenced by the market's recent behavior. A down (up) trend should fuel pessimism (optimism). This is supported by studies demonstrating

that people suffer from an availability bias, the tendency to overestimate the probability of an event which is easily brought to mind due to recency or vividness. Thus, investors would likely overestimate the probability that a recent trend will continue. Empirical support can be found in Fosback (1976), Solt & Statman (1988), De Bondt (1993), Clarke and Statman (1998), Fisher and Statman (2000), Simon and Wiggens (2001), Brown & Cliff (2004) Wang, Keswani & Taylor (2006).

Tests of Predictive Power

Tests of SI predictive power are numerous but inconsistent. However, because the studies consider different SI, historical periods, and evaluation metrics, a firm conclusion is difficult.

Two evaluation methods have been used: correlation and the profitability of rule-based signals. Correlation quantifies the strength of the relationship between sentiment and the market's future return in terms of r-squared, which is the percentage of the variation in return that is predicted by the SI. The signal approach measures the financial performance of sell (buy) signals given when the indicator crosses a threshold indicating excessive optimism (pessimism). Here a useful metric is the profit factor, the ratio of gains from profitable signals to losses from unprofitable signals. It implicitly takes into account the fraction of profitable signals and the average size of wins and losses. Values above 1.0 indicate a profitable rule, while values less than 1.0 indicate an unprofitable rule. Because market conditions over a given test period can profoundly impact the profit factor, an important benchmark for comparison is the profit factor of a similar number of random signals over the same time period.

Using both methods, Fosback (1976) tests numerous sentiment indicators on data from 1941 through 1975, finding that some are predictive individually and conjointly when used in multiple-regression models. Solt & Statman (1988) test INV from 1963 to 1985 and find no predictive power, and attribute a pervasive belief in INV's efficacy to cognitive errors (confirmation bias and erroneous intuitions about randomness). Clark & Statman (1998) use an additional ten years of data and confirm INV's lack of utility. Fisher & Statman (2000) confirm this result but find that AAII is predictive. They use multiple regression to combine several SI and obtain an r-squared of 0.08 which has economic value in market timing. Simon & Wiggens (2001) use data from 1989 to 1998 to show that VIX and S&P100 option put-to-call ratio are statistically significant predictors of S&P500 over 10 to 30 days forward and derive an effective signaling rule. They conclude the SI examined frequently have statistically and economically significant predictive value. Hayes (1994) combines stock market sentiment with that of gold and treasury bonds to form a composite SI for stocks and finds rule-based signals that are useful. In contrast, Brown and Cliff (2004) tested ten SI observed monthly from 1965 to 1998, and weekly from 1987 to 1998 and find that used individually or combined they have limited ability to predict near-term market returns. Wang, Keswani & Taylor (2006) test OEX put-to-call volume ratio, OEX put-to-call open interest ratio, AAII and INV using regression and find no predictive power. Clearly, the evidence is mixed.

Regression Modeling for Indicator Purification

Indicator purification via regression modeling is introduced by Fosback (1976). He finds sentiment of odd-lot short sellers and mutual fund managers is predictable and that they have enhanced forecasting significance when they deviate from predicted levels. The Fosback Index (FI) is the deviation of mutual fund cash-to-asset ratio (CAR) from a regression model's prediction based on short-term interest rates. FI signals are superior to CAR. Goepfert (2004) applies Fosback's method to more recent data, confirming the relation between short-term interest and CAR (r-squared 0.55) and the potency of FI signals.

Merrill (1982) uses regression to remove the effect of beta from a stock's relative strength ratio (RS). A limited test shows purified RS signals are superior to those obtained from traditional RS. Jacobs and Levy (2000), use multiple regression to purify 25 fundamental and technical indicators and demonstrate that

the purified indicators have improved predictive power and independence. Stonecypher (1988) derives an "available liquidity" indicator, the deviation of stocks prices from a regression prediction based on mutual fund cash, credit balances and short interest.

C. How This Paper Extends Prior Research

Our research extends prior research in several ways. First, we apply regression purification to five SI not previously treated in this manner. Second, while prior studies use static regression models, ours is adaptive, with periodic refitting to allow changing indicators and indicator weights to capture changes in the linkage between market dynamics and sentiment. Third, while prior studies have established the link between price velocity and SI, our study also considers acceleration and volatility. Fourth, unlike prior studies using regression for purification, we normalize the deviation between observed and predicted sentiment by the model's standard error, thus producing an indicator with more stable variance. Fifth, prior efforts to reduce drift and stabilize the variability of SI use the trend and variability of the SI itself. Instead we use the stock market's price dynamics because of their established influence on sentiment.

II. Analysis Procedure

A. Sentiment Indicators Analyzed

American Association of Individual Investors Sentiment Survey **(AAII)**: July 27, 1987 to October 31, 2008, published weekly. Source Ultra Financial Systems (www.ultrafs.com)

Investors Intelligence Advisor Sentiment Bulls - Bears **(INV)**: January 4, 1963 to October 31, 2008, published weekly by Investor's Intelligence.

Hulbert Stock Newsletter Sentiment Index **(HUL)**: January 2, 1985 to October 31, 2008, published weekly, is the average recommended stock market exposure for a subset of short-term market timers tracked by the Hulbert Financial Digest. Source: Mark Hulbert.

CBOE Equity Put to Call Volume Ratio **(PCR)**: October 1, 1985 through October 31, 2008. Series includes ETF options. Source: Luthold Group.

CBOE Implied Volatility Index **(VIX)**: January 2, 1986 through October 31, 2008. It is an indicator of the implied volatility of SP500 index options. Prior to 2003 it was based on S&P100 options. Source: Ultra Financial Systems (www.ultrafs.com).

B. Method Used To Derive Purified Sentiment Indicators

The conceptual basis of our purification method is seen in Figure 1, a scatterplot of velocity (price dynamics) versus a sentiment indicator. Each point on the plane is a combination of sentiment and velocity.

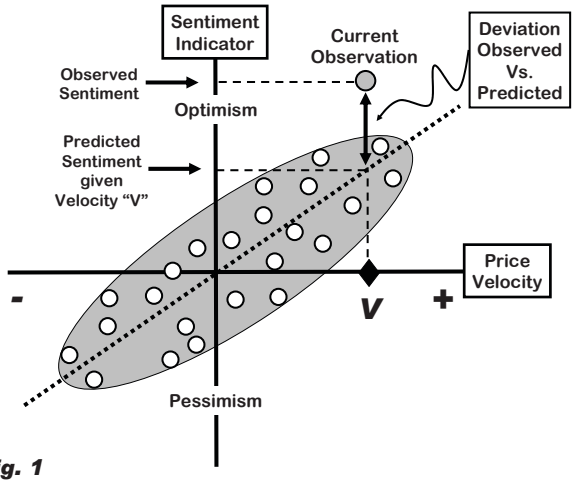


Fig. 1

The elongated cloud of points is the window of recent observations used to fit the regression model relating sentiment to price velocity. The dotted line is the model's predicted value of sentiment for each value of velocity. For example, given velocity "V" on the horizontal axis, the model would predict the level of sentiment indicated on the vertical axis. However, current observed sentiment (large dot) is greater than the predicted value (i.e. excessive optimism). The vertical deviation from the regression line when divided by a measure of the degree of spread of the points around the line (standard error) is *purified sentiment* or sentiment net of price dynamics.

Our model, which uses two indicators of price dynamics to predict sentiment, is portrayed in Figure 2. The model's predictions are represented by the grey plane.

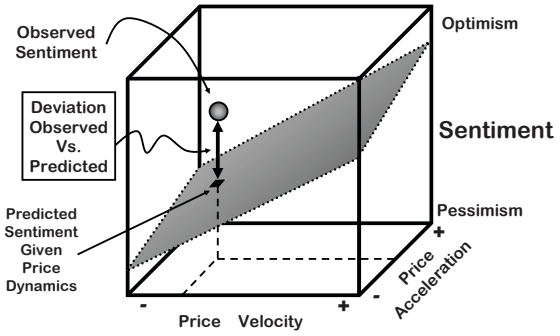


Fig. 2

The model uses a moving data window comprising the 300 most recent observations. This window is referred to as a *fold*.

The model is adaptive in two ways. First, every 10th day the model's indicator weights are allowed to change to reflect possible changes in the relationship between price dynamics and sentiment. The weights determine the inclination of the plane. Second, every 100th day we allow the pair of price dynamics indictors used in the model to change. This allows it to capture the evolving relationship between sentiment and price dynamics. The pair that provides the best fit (r-squared) to 300 days of data in the current fold is selected from a set 18 candidates described below and is retained until indicator selection takes place again 100 days hence. Given the historical data used, this procedure allows for a total of 48 folds each overlapping the two nearest folds by 200 days. All 153 possible pairs (18x17 / 2) are evaluated to select the best. The parameters (300, 10, 100) were selected arbitrarily based on intuition and are likely not optimal. In the results section we show how frequently each of the 18 indicators was selected as a member of the best pair (percent of 48 folds in which the indicator was selected).

The 18 candidate price dynamics indicators are of 3 types: velocity, acceleration and volatility, with six variants of each type. The variants differ with respect to the number of days used to measure velocity and acceleration or with respect to the exponential smoothing constant used to measure volatility. Type 1 (price velocity) is the slope term of a moving linear regression, fit using least squares, to the logs of the S&P500 close. The six fitting or look-back periods are 11, 22, 44, 65, 130 and 260 days. Specifically, we define price velocity as the coefficient "b" in the function $y = a + bx$, where y is the log of price and x is the date index (increasing by one for each trade date). Type 2 (price acceleration or curvature) is the second order term of a moving parabolic regression, fit using least squares to the logs of the S&P500 close using fitting periods of 11, 22, 44, 65, 130 and 260 days. Thus acceleration is the "c" coefficient in the function $y = a + bx + cx^2$ where y is the log of price and x is the date index. Type 3 (price volatility) is the exponentially smoothed absolute value of the daily percentage change in the SP500 close, using smoothing constants of 0.1666, 0.0870, 0.0444, 0.0303, 0.0154, 0.0077, which approximate moving averages of 11, 22, 44, 65, 125 and 260 days respectively. For a listing of the 18 price dynamics indicators see Table 1.

Table 1: 18 Price Dynamics Indicators

	Type	Indicator Description
1	Velocity	Linear Slope 11 days
2	Velocity	Linear Slope 22 days
3	Velocity	Linear Slope 44 days
4	Velocity	Linear Slope 65 days
5	Velocity	Linear Slope 130 days
6	Velocity	Linear Slope 260 days
7	Acceleration	Parabolic Curvature 11 days
8	Acceleration	Parabolic Curvature 22 days
9	Acceleration	Parabolic Curvature 44 days
10	Acceleration	Parabolic Curvature 65 days
11	Acceleration	Parabolic Curvature 130 days
12	Acceleration	Parabolic Curvature 260 days
13	Volatility	Expo. Smoothed |% change| m.a. approx. 11 days
14	Volatility	Expo. Smoothed |% change| m.a. approx. 22 days
15	Volatility	Expo. Smoothed |% change| m.a. approx. 44 days
16	Volatility	Expo. Smoothed |% change| m.a. approx. 65 days
17	Volatility	Expo. Smoothed |% change| m.a. approx. 130 days
18	Volatility	Expo. Smoothed |% change| m.a. approx. 260 days

PSI for a given date is the deviation of observed SI from the model's predicted SI value given the values of the price dynamics indicators in the regression model as of that date, divided by model's standard error as of that date. When the model is less predictive (i.e. larger standard errors) the divisor is larger, thus reducing the PSI value. This lends greater uniformity to the variability of purified sentiment over time, an important feature for threshold-based signaling rules.

Using this approach we derive daily values for purified sentiment indicators for five SI: AAII, INV, HUL, PCR, and VIX. Although AAII, INV, HUL are weekly series, we produce daily values by holding the most recently known weekly value constant until a new value is available. To avoid look-ahead bias, the data is dated as of the time it is known by investors.

C. SI and PSI Tested for Signal Performance

From the five sentiment series (AAII, HUL, INV, PCR & VIX) we derive 50 indicators: 25 SI and 25 PSI. Using AAII as an example: [1]AAII no smoothing, [2], [3], [4] and [5] are exponentially smoothed versions of AAII using smoothing constants (simple moving average equivalent) of 0.1666 (11), 0.0870 (22), 0.0444 (44), 0.0303 (65), [6] purified AAII no smoothing, [7], [8], [9] and [10] exponentially smoothed versions of [6] using the smoothing constants just mentioned. The 50 indicators are listed in Table 2.

Table 2.

Number	Description
1	AAII no smoothing
2	AAII Expo. Smooth 11 day (0.1666)
3	AAII Expo. Smooth 22 day (0.0870)
4	AAII Expo. Smooth 44 day (0.0444)
5	AAII Expo. Smooth 65 day (0.0303)
6	AAII Purified no smoothing
7	AAII Purified Exp. Smooth 11 day (0.1666)
8	AAII Purified Exp. Smooth 22 day (0.0870)
9	AAII Purified Exp. Smooth 44 day (0.0444)
10	AAII Purified Exp. Smooth 65 day (0.0303)
11	INV no smoothing
12	INV Expo. Smooth 11 day (0.1666)
13	INV Expo. Smooth 22 day (0.0870)
14	INV Expo. Smooth 44 day (0.0444)
15	INV Expo. Smooth 65 day (0.0303)
16	INV Purified no smoothing
17	INV Purified Exp. Smooth 11 day (0.1666)
18	INV Purified Exp. Smooth 22 day (0.0870)
19	INV Purified Exp. Smooth 44 day (0.0444)
20	INV Purified Exp. Smooth 65 day (0.0303)
21	HUL no smoothing
22	HUL Expo. Smooth 11 day (0.1666)
23	HUL Expo. Smooth 22 day (0.0870)
24	HUL Expo. Smooth 44 day (0.0444)
25	HUL Expo. Smooth 65 day (0.0303)
26	HUL Purified no smoothing
27	HUL Purified Exp. Smooth 11 day (0.1666)
28	HUL Purified Exp. Smooth 22 day (0.0870)
29	HUL Purified Exp. Smooth 44 day (0.0444)
30	HUL Purified Exp. Smooth 65 day (0.0303)
31	PCR no smoothing
32	PCR Expo. Smooth 11 day (0.1666)
33	PCR Expo. Smooth 22 day (0.0870)
34	PCR Expo. Smooth 44 day (0.0444)

35 PCR Expo. Smooth 65 day (0.0303)
36 PCR Purified no smoothing
37 PCR Purified Exp. Smooth 11 day (0.1666)
38 PCR Purified Exp. Smooth 22 day (0.0870)
39 PCR Purified Exp. Smooth 44 day (0.0444)
40 PCR Purified Exp. Smooth 65 day (0.0303)
41 VIX no smoothing
42 VIX Expo. Smooth 11 day (0.1666)
43 VIX Expo. Smooth 22 day (0.0870)
44 VIX Expo. Smooth 44 day (0.0444)
45 VIX Expo. Smooth 65 day (0.0303)
46 VIX Purified no smoothing
47 VIX Purified Exp. Smooth 11 day (0.1666)
48 VIX Purified Exp. Smooth 22 day (0.0870)
49 VIX Purified Exp. Smooth 44 day (0.0444)
50 VIX Purified Exp. Smooth 65 day (0.0303)

D. Profit Factor Evaluation of Indicators

We evaluate SI and PSI and price dynamics indicators in terms of PF realized from long and short positions in the SP500 rather than their correlation with SP500 future returns. Although Clarke et al. (1989) show that a significant correlation implies favorable financial performance from a timing strategy, the converse is not true. An insignificant correlation does not necessarily imply poor financial performance. Thus, while correlation can fail to detect indicators able to deliver good financial performance, the prime concern of investors, PF explicitly measures it.

Because PF is computed from signal outcomes, a signaling rule must be defined. We define 100 sentiment based signaling rules, one long and one short for each of the 25 SI and 25 PSI. In addition, to measure the predictive power of price dynamics, we define 36 signaling rules based on the 18 price dynamics indicators (Table 1). Thus the 18 price dynamics indicators play two roles in this study. They are used to predict and thus purify sentiment. They are also used for signaling rules to trade the SP500.

Signals occur when the indicator crosses a threshold. We use a cross-validation procedure to establish the signal threshold in-sample and measure the rule's PF performance the out-of-sample. Our procedure is to segment the historical data, 1990/01/01 to 2008/10/31, by calendar year into 19 chunks. In turn, each year is held aside as out-of-sample data (OUT) while the remaining 18 years are treated as in-sample (IN). IN is used to search for two signal thresholds, one that maximizes buy-signal PF and one that maximizes sell-short-signal PF. We then apply these thresholds to OUT to obtain signal outcomes. This procedure is performed a total of 19 times, withholding a different year each time as OUT. A separate PF long and a PF short is then computed from a concatenation of the OUT signals. Thus each rule is characterized by two figures of merit, long PF OUT and short PF OUT. The procedure of using IN to optimize a rule and OUT to evaluate its performance is called cross validation. It has the advantage of providing a nearly unbiased estimate of rule performance in different data. In contrast, evaluating a rule in the same data that was also used to construct or optimize the

rule is known to give optimistically biased estimates of its performance in different data.

Our procedure enters a long or short position in SP500 on the opening price of the day following a signal and liquidates the position on the following opening price. If the signal is still in effect on the following day (indicator remains beyond threshold) a new position is established at the open (the same price at which a position was just liquidated). This ensures the independence of signal outcomes, a requirement for significance testing. We test the null hypothesis that the buy rule's (sell-short rule's) PF is no better than that of a random signal taking the same number of positions. In Figures 19 – 34 we highlight PF for all rules that are significant at the 0.05 level. The distribution of PF, if the null hypothesis were true, is generated with a Monte-Carlo permutation test with 1000 replications. This distribution represents the random variation one would expect in PF for a rule with no predictive power. If the PF of the rule tested is greater than 950 of the 1000 replications (i.e., only 50 have higher PF) the rule is judged to be statistically significant.

Because we test 136 rules, including the 36 buy and sell rules based on the 18 price dynamics indicators, listed Table I, we would expect a certain number to appear significant by chance. Note that it is possible for a rule with a lower PF to be more significant than another rule with a higher PF when the latter has a smaller number of signals. Significance depends on both PF achieved and the number of signals allowed by the threshold.

III. Results

A. How Predicable is Sentiment from Price Dynamics?

Figure 3a shows how well the two-indicator regression model was able to predict each SI. The r-squared is the average over 48 folds, each comprised of 300 observations, with a 200-observation overlap between folds. Note there are two sources of upward bias in the r-squared values reported in Figure 3a. First, the selection of a best pair of price dynamics indicators from 153 possible pairs there creates an upward bias. Second, there is an upward bias for its being an in-sample regression fit. For this reason we show in Figure 3b the average r-squared of all pairs tested (153 x 48).

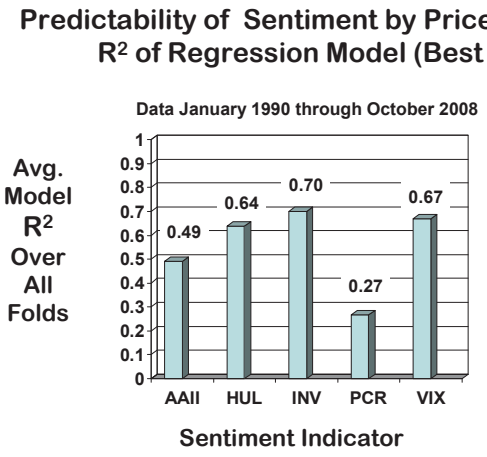


Fig. 3a

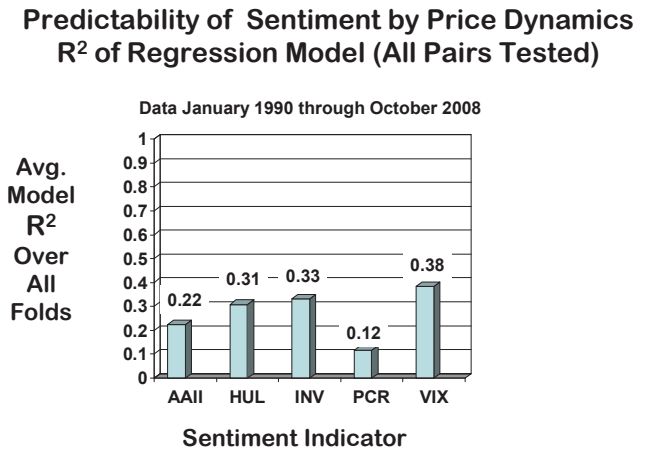


Fig. 3b

B. Relative Importance of 18 Price Dynamics Indicators in Predicting Sentiment

Figures 4 through 8 show the relative importance of the 18 price dynamics indicators in predicting each of the five sentiment indicators. The importance of each indicator is given in terms of the percentage of folds (48) the indicator was selected as a member of the best pair used in the regression model. The look-back span for the most frequently used indicators is supplied for convenience. If the indicator's regression weight has the same algebraic sign (always + or always -) across all folds in which it was used, its bar it is colored dark blue.

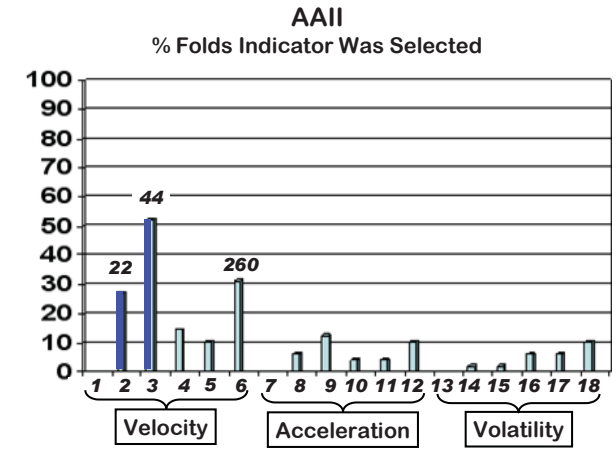


Fig. 4

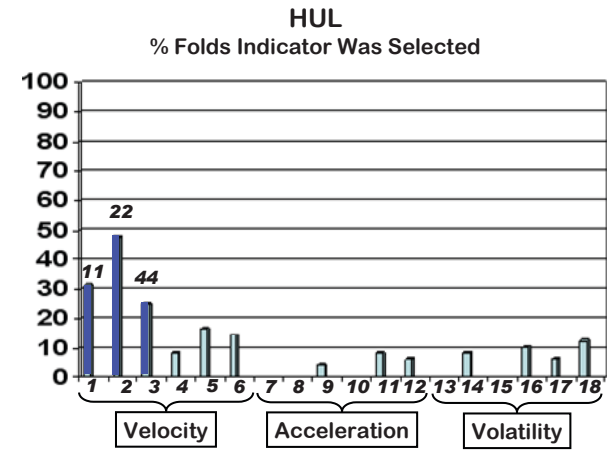


Fig. 5

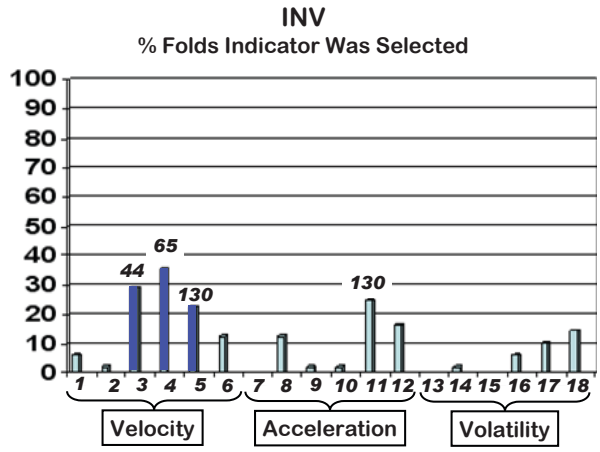


Fig. 6

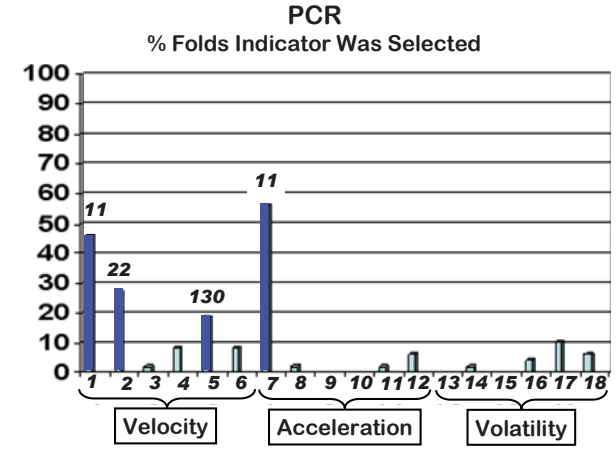


Fig. 7

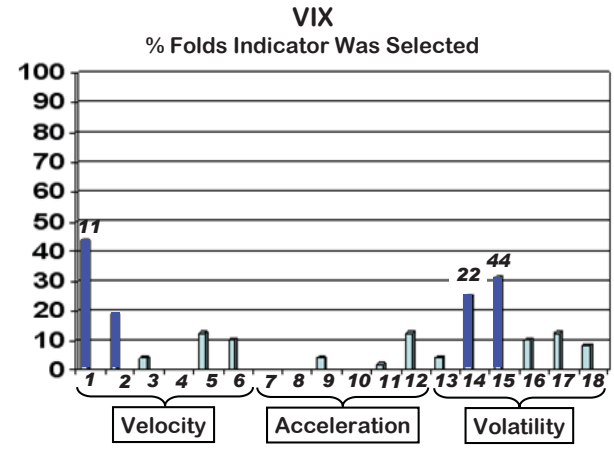


Fig. 8

C. Histories of SI & PSI

Figures 9 through 18 display the history of each SI and PSI exponentially smoothed to approximate a 65-day moving average (smoothing constant 0.0303). The SI series display considerable drift and change in variability. In contrast, the PSI display greater stability in both features, important attributes for signaling rules based on fixed thresholds.

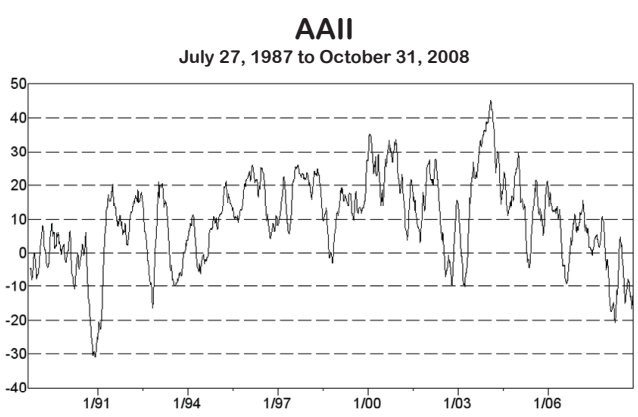


Fig. 9

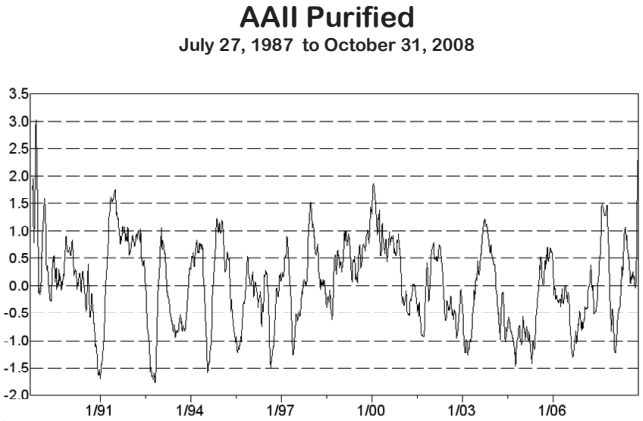


Fig. 10

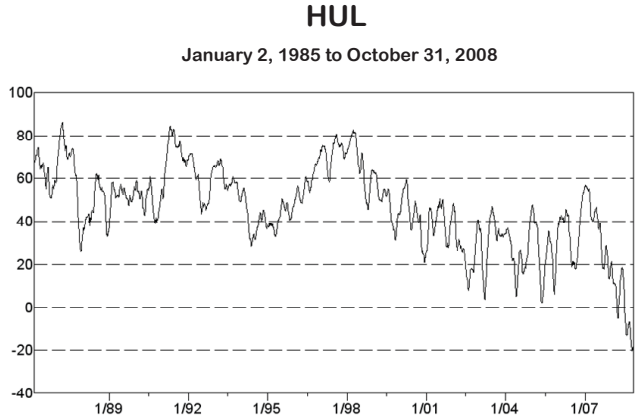


Fig. 11

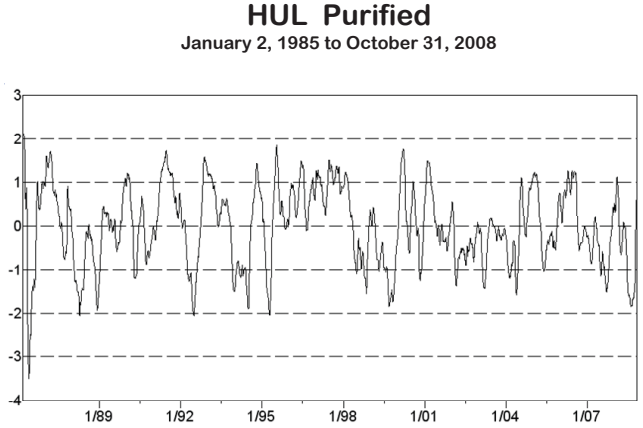


Fig. 12

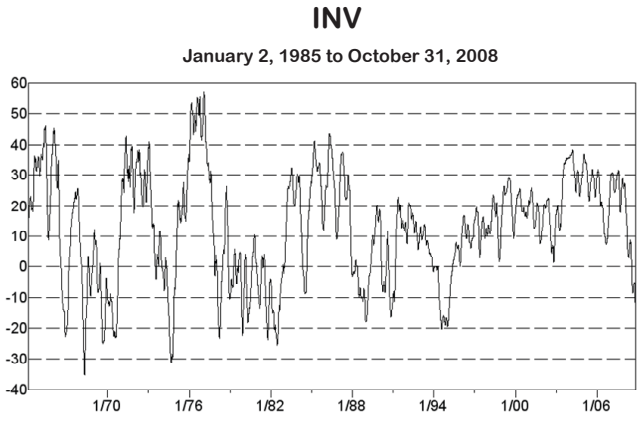


Fig. 13

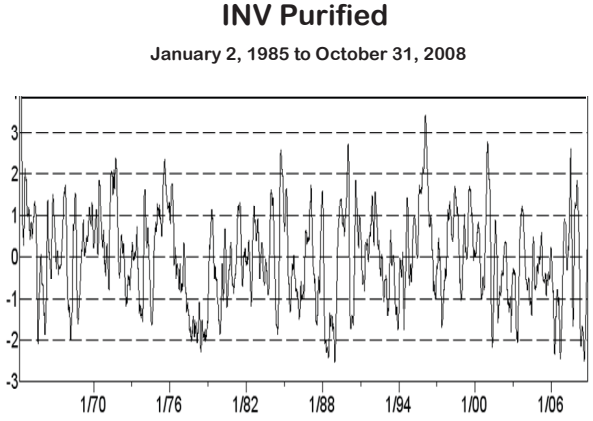


Fig. 14

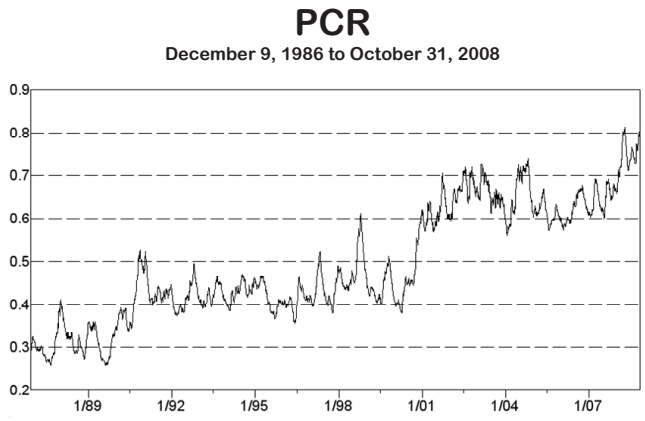


Fig. 15

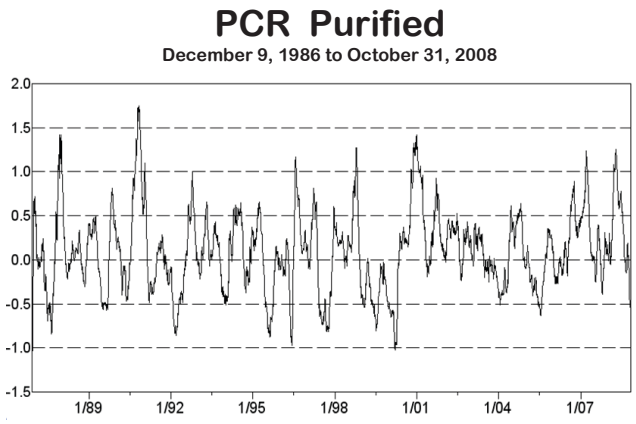


Fig. 16

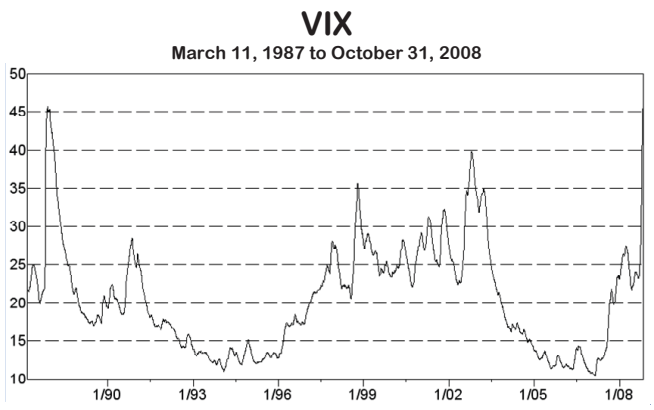


Fig. 17

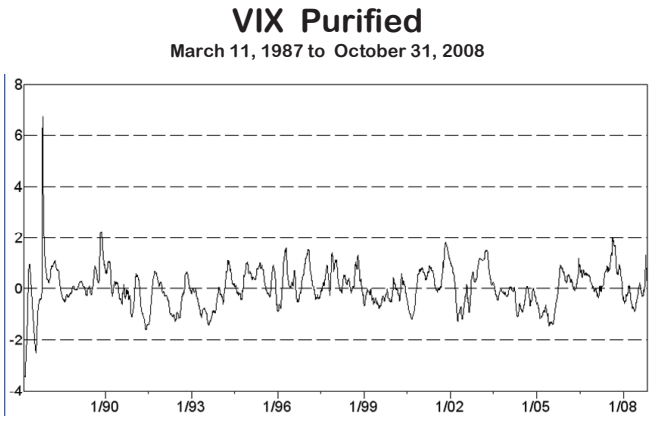


Fig. 18

D. Profit Factor Comparisons

Figures 19 through 28 show out-of-sample PF for 50 long and 50 short rules trading the S&P500 Index from January 1, 1990 through October 31, 2008. SI PF are depicted by red bars and PSI by blue. PF values are shown above each bar. Rules with statistically significant PF at the 0.05 level relative to a random signal taking the same number of positions are highlighted (asterisked and boxed). For comparison purposes Figures 29 through 34 show out-of-sample PF for 36 long and short rules based on 18 price dynamics indicators to indicate their predictive power for the SP500.

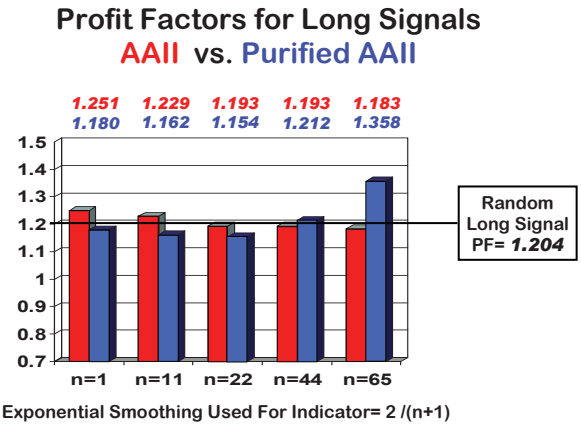


Fig. 19

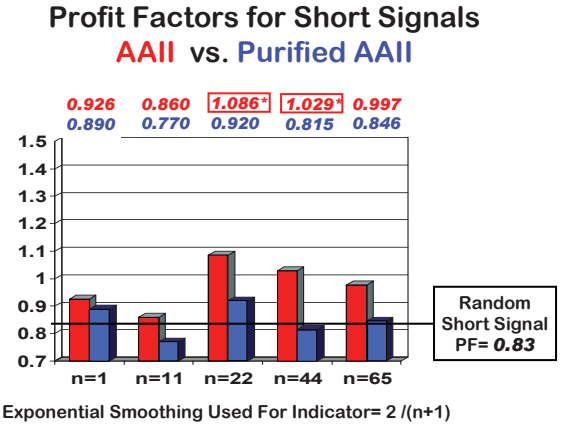


Fig. 20

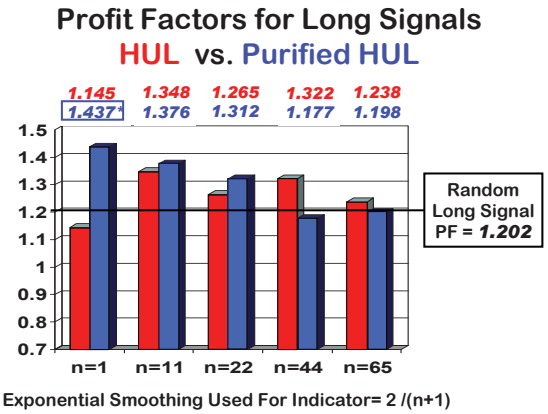

Profit Factors for Long Signals
HUL vs. Purified HUL
1.145 1.348 1.265 1.322 1.238
1.437* 1.376 1.312 1.177 1.198
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
n=1 n=11 n=22 n=44 n=65
Random Long Signal PF = 1.202
Exponential Smoothing Used For Indicator= 2 /(n+1)

Fig. 21

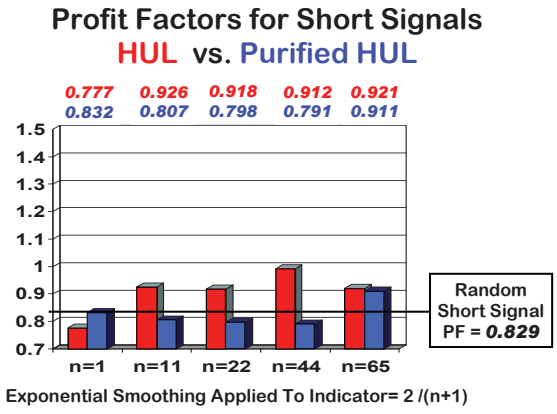

Profit Factors for Short Signals
HUL vs. Purified HUL
0.777 0.926 0.918 0.912 0.921
0.832 0.807 0.798 0.791 0.911
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
n=1 n=11 n=22 n=44 n=65
Random Short Signal PF = 0.829
Exponential Smoothing Applied To Indicator= 2 /(n+1)

Fig. 22

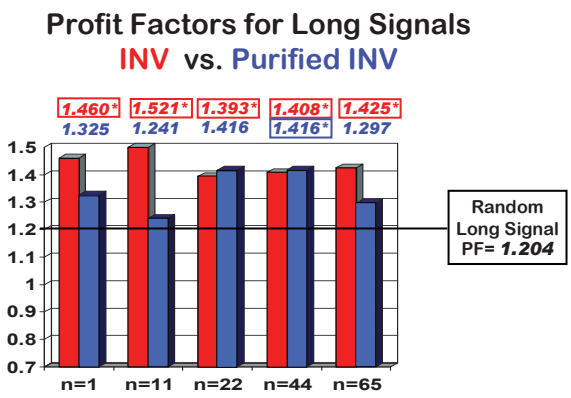

Profit Factors for Long Signals
INV vs. Purified INV
1.460* 1.521* 1.393* 1.408* 1.425*
1.325 1.241 1.416 1.416* 1.297
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
n=1 n=11 n=22 n=44 n=65
Random Long Signal PF= 1.204
Exponential Smoothing Used For Indicator= 2 /(n+1)

Fig. 23

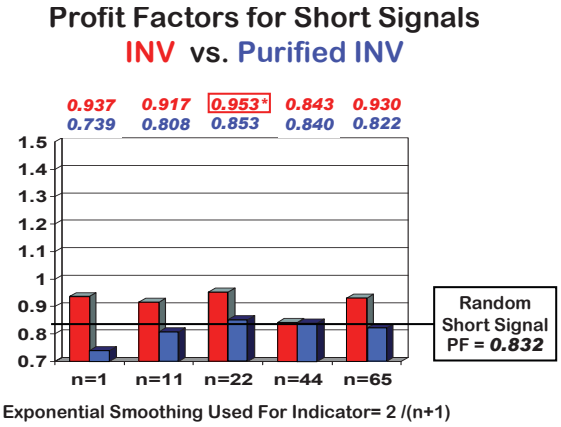

Profit Factors for Short Signals
INV vs. Purified INV
0.937 0.917 0.953* 0.843 0.930
0.739 0.808 0.853 0.840 0.822
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
n=1 n=11 n=22 n=44 n=65
Random Short Signal PF = 0.832
Exponential Smoothing Used For Indicator= 2 /(n+1)

Fig. 24

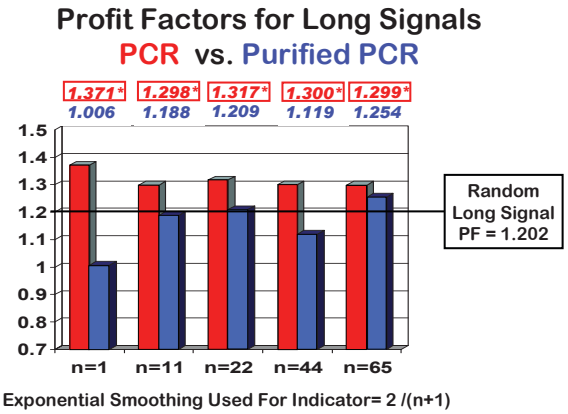

Profit Factors for Long Signals
PCR vs. Purified PCR
1.371* 1.298* 1.317* 1.300* 1.299*
1.006 1.188 1.209 1.119 1.254
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
n=1 n=11 n=22 n=44 n=65
Random Long Signal PF = 1.202
Exponential Smoothing Used For Indicator= 2 /(n+1)

Fig. 25

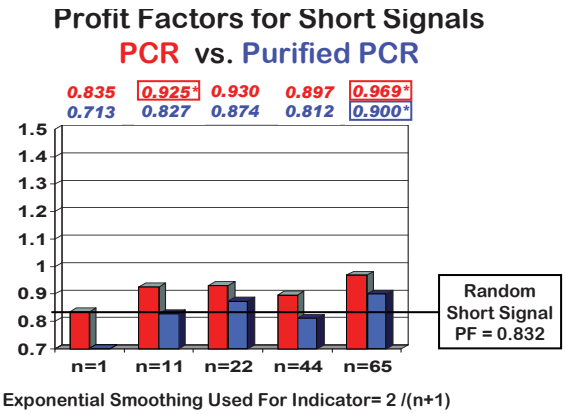

Profit Factors for Short Signals
PCR vs. Purified PCR
0.835 0.925* 0.930 0.897 0.969*
0.713 0.827 0.874 0.812 0.900*
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
n=1 n=11 n=22 n=44 n=65
Random Short Signal PF = 0.832
Exponential Smoothing Used For Indicator= 2 /(n+1)

Fig. 26

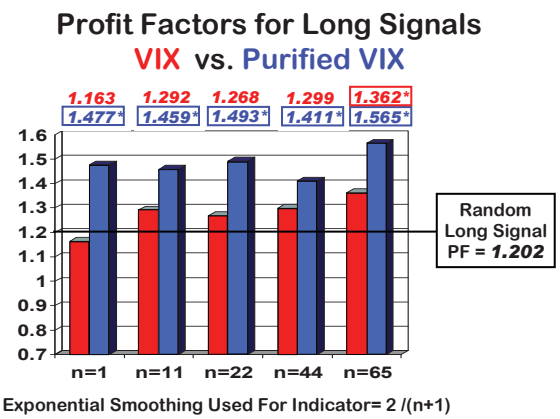

Profit Factors for Long Signals
VIX vs. Purified VIX
1.163 1.292 1.268 1.299 1.362*
1.477* 1.459* 1.493* 1.411* 1.565*
1.6 1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
n=1 n=11 n=22 n=44 n=65
Random Long Signal PF = 1.202
Exponential Smoothing Used For Indicator= 2 /(n+1)

Fig. 27

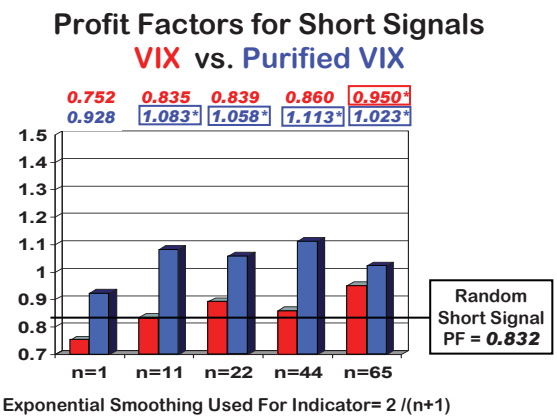

Profit Factors for Short Signals
VIX vs. Purified VIX
0.752 0.835 0.839 0.860 0.950*
0.928 1.083* 1.058* 1.113* 1.023*
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
n=1 n=11 n=22 n=44 n=65
Random Short Signal PF = 0.832
Exponential Smoothing Used For Indicator= 2 /(n+1)

Fig. 28

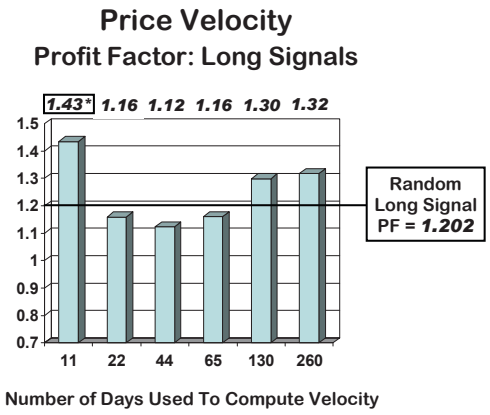

Price Velocity
Profit Factor: Long Signals
1.43* 1.16 1.12 1.16 1.30 1.32
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
11 22 44 65 130 260
Random Long Signal PF = 1.202
Number of Days Used To Compute Velocity

Fig. 29

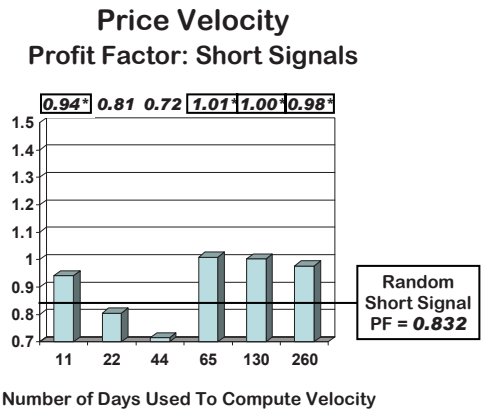

Price Velocity
Profit Factor: Short Signals
0.94* 0.81 0.72 1.01* 1.00* 0.98*
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
11 22 44 65 130 260
Random Short Signal PF = 0.832
Number of Days Used To Compute Velocity

Fig. 30

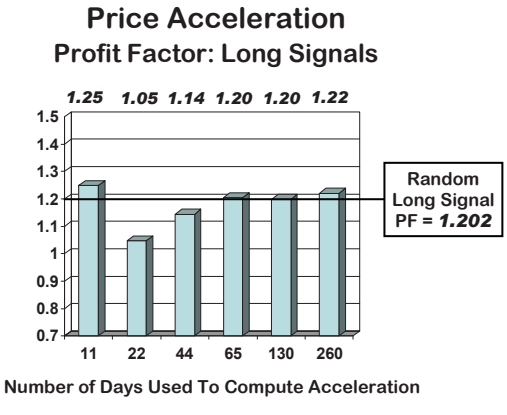

Price Acceleration
Profit Factor: Long Signals
1.25 1.05 1.14 1.20 1.20 1.22
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
11 22 44 65 130 260
Random Long Signal PF = 1.202
Number of Days Used To Compute Acceleration

Fig. 31

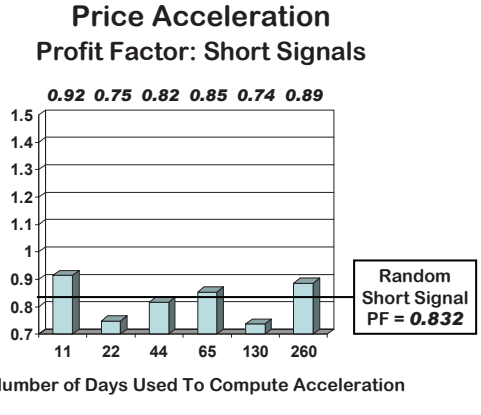

Price Acceleration
Profit Factor: Short Signals
0.92 0.75 0.82 0.85 0.74 0.89
1.5 1.4 1.3 1.2 1.1 1 0.9 0.8 0.7
11 22 44 65 130 260
Random Short Signal PF = 0.832
Number of Days Used To Compute Acceleration

Fig. 32

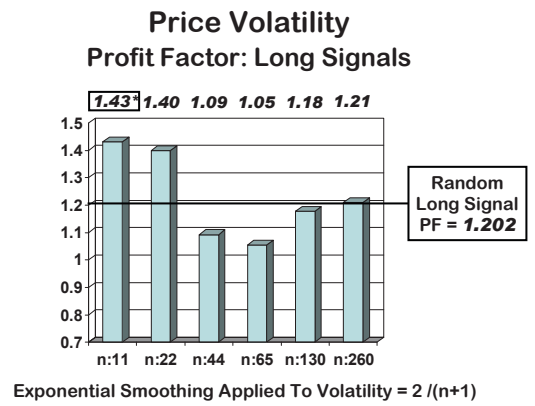


Fig. 33

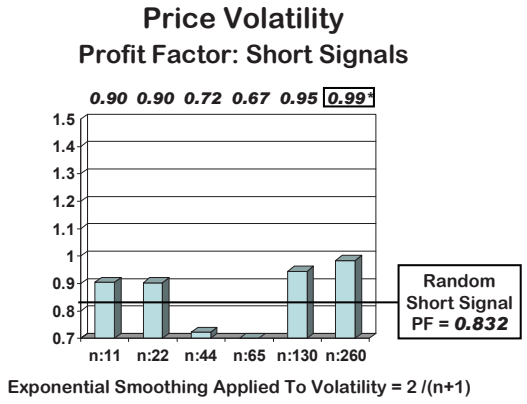


Fig. 34

IV. Discussion & Conclusion

The five SI series analyzed are generally well predicted from price dynamics. R-squared ranges from 0.27 to 0.70 with an average of 0.55, but these values are upwardly biased due to in-sample model fitting as well as selection bias in the choice of price dynamics indicators used as predictors. For this reason we show average r-squared values for all models tested in Figure 3b. However, there are differences as to which price dynamics indicators dominate for a given SI. Sentiment polls (INV, HUL and AAII) are dominated by price velocity. PCR, the least well predicted, is dominated by 11-day acceleration. VIX is driven by velocity but also volatility (22 & 44 days). The relatively low r-squared for PCR may suggest a non-linear relationship to price dynamics, which our linear regression model would not pick up, other factors not included in our model, or a higher inherent unpredictability.

The obvious nonstationarity of SI seen in Figures 9, 11, 13, 15 and 17, which makes fixed-threshold signaling rules problematic, is markedly reduced by purification. The PSI in Figures 10, 12, 14, 16 and 17 speak loudly to this point. Drift is eliminated and unstable variability is attenuated.

Our initial intuition that purification would improve predictive power for all SI was not substantiated. With respect to sentiment polls, AAII, INV and HUL, 8 of 30 (long & short) rules based on unpurified SI (red bars in Figures 19 through 24) were significant at the 0.05 level. Only 2 of 30 rules based on PSI (blue bars in Figures 19 through 24) were significant. The one instance where PSI was significant and superior to the SI version (long rule for HUL n=1 in Figure 21) seems too isolated to be important.

Rules based on unpurified PCR (red bars in Figures 25 and 26) yielded a significant PF in 7 of 10 cases. Only 1 of 10 rules based on purified PCR produced a significant PF, and in all instances PF based on the PSI version of PCR were lower than SI versions. The strong drift in PCR (Figure 15) calls into question the 7 significant PF, as the rules were based on fixed thresholds.

The standout exception is VIX. Figures 27 and 28 show purification produces a strong improvement PF. While only 2 of 10 rules based on unpurified VIX beat a random signal, 9 of 10 rules based on purified VIX display a significant PF. This suggests that VIX contains predictive information above and beyond price dynamics that is masked by the strong influence that price dynamics have on VIX. *We believe that purified VIX represents an improvement over standard VIX, and price dynamics purification represents a step forward in sentiment analysis in general as it can point to indicators that contain information that is not redundant of that found in price indicators.* We are at a loss, however, to explain why VIX contains information beyond price or why price clouds that information. This is a worthwhile area of inquiry as it may point to new areas of sentiment analysis.

Of the 36 long & short rules based on the 18 price dynamics indicators (Figures 29 through 34), 7 produced profit factors that are statistically significant relative to a random signal. Of these, 5 are velocity based and 2 are volatility based. Acceleration produced no significant rules. The predictive power in velocity and the strong impact of velocity on sentiment polls (AAII, INV & HUL) suggests that the predictive power residing in the unpurified form may largely derive from the predictive power of velocity. In other words, the polls are proxies for price velocity.

A strong motivation for utilizing SI is to obtain predictive information that is independent of and accretive to that found in price-based indicators. Our study of suggests that AAII, INV, HUL and PCR add minimal value once price indicators have been utilized. This is most problematic for analysts who use subjective judgment to combine price indicators with unpurified sentiment indicators. This double counting could result in price being given excessive weight. Those using a statistical model derived with automated indicator selection do not face this issue as redundant indicators are not likely to be included in the model.

References

Brown, Gregory, W. and Cliff, Michael T. (2004), "Investor sentiment and the near-term stock market," Journal of Empirical Finance, vol 11, no.1, (January):1-27

Clark, R.G., Fitzgerald, M.T, Berant, P. and Statman, M. (1989), "Market Timing with Imperfect Information," Financial Analysts Journal, vol. 45, no. 6, (November/December): 27-36

Clark, R.G., and Statman, Meir (1998), "Bullish or Bearish?", Financial Analysts Journal, (May/June), 63-72

De Bondt, Werner, (1993), "Betting on Trends: Intuitive Forecasts of Financial Risk and Return," International Journal of Forecasting, vol. 9, no.3, (November): 355-371

Fisher, Kenneth L. and Statman, Meir (2000), "Investor sentiment and stock returns," Financial Analysts Journal, Vol. 56, no. 2. (Mar/April): 16-23

Fosback, Norman, G., (1976), *Stock Market Logic: A Sophisticated Approach to Profits on Wall Street*, Dearborn Financial Publishing, Inc., The book is no longer in print.

Goepfert, Jason, "Mutual Fund Cash Reserves, the Risk-Free Rate and Stock Market Performance," MTA Journal, no. 62 (Summer-Fall 2004):12-17

Hayes, Timothy, (1994), "Using Market Sentiment in One Market to Call Prices in Another," MTA Journal, no. 44, (Winter 1994-Spring 1995):10-25

Hayes, Timothy, (2001), *The Research Driven Investor*, McGraw-Hill, New York

Jacobs, Bruce and Levy Kenneth, (2000), *Equity Management: Quantitative Analysis for Stock Selection*, McGraw-Hill, New York

Merrill, Arthur, (1982)" DFE Deviation From Expected (Relative Strength Corrected for Beta)," MTA Journal, no. 14, (August): 21-28

Simon, David P. and Wiggens III, Roy A., (2001) "S&P futures returns and contrary sentiment indicators," The Journal of Futures Markets, Vol.21, no.5

Solt, Machael E., and Statman, Meir (1998), "How Useful is the Sentiment Index?", Financial Analysts Journal, vol. 44, no.5, (September/October):44-55

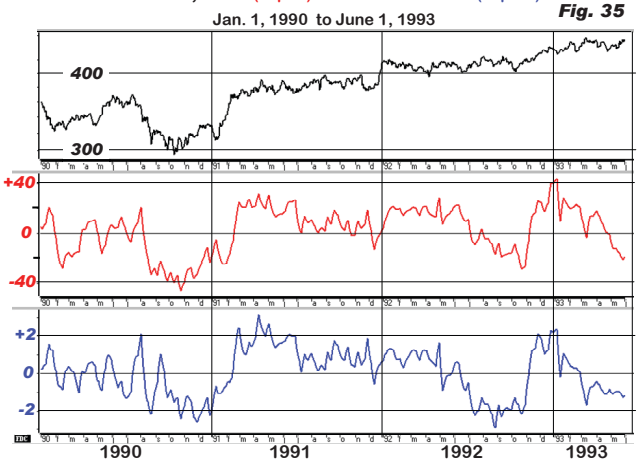
Stonecypher, Lance, (1988) "Liquidity Indicators – Still Valuable Market Timing Tools," MTA Journal, no. 29 (February):15-23

Wang, Yaw-Huei and Kewwani, Aneel and Taylor, Stephan J., (2006) "The relationships between sentiment, returns and volatility," International Journal of Forecasting vol. 22, no. 1 (Jan-March).

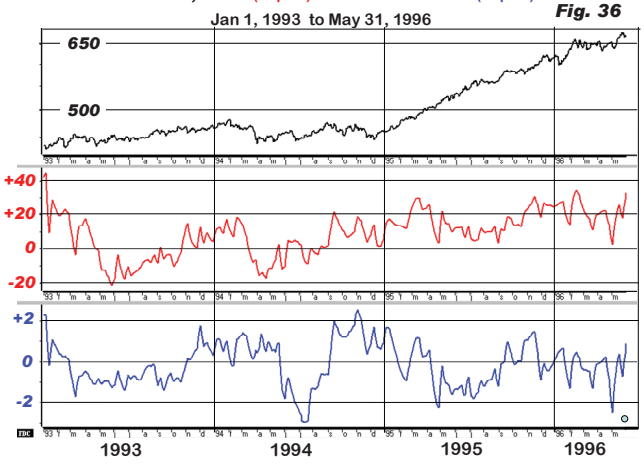
V. Appendix 1

Figures 35 through 63 provide more detailed views of SI (red), PSI (blue) and the SP500. The indicators displayed are the 10 day exponentially smoothed version of each SI and PSI.

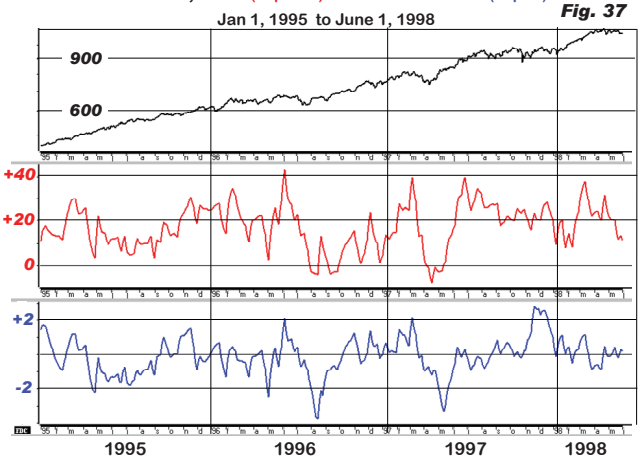
S&P 500, AAII (exp10) & Purified AAII (exp.10)
Jan. 1, 1990 to June 1, 1993
Fig. 35



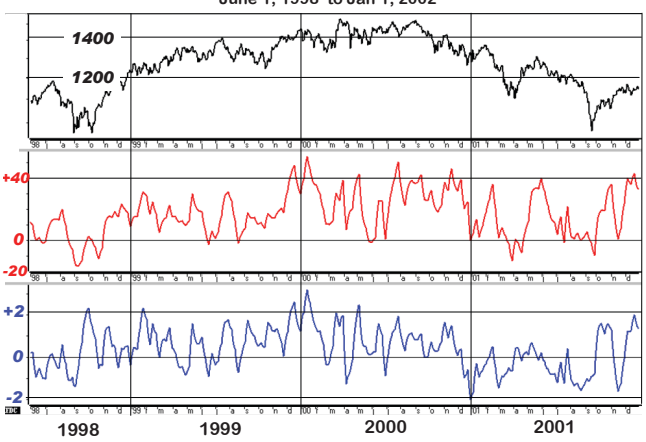
S&P 500, AAII (exp10) & Purified AAII (exp10)
Jan 1, 1993 to May 31, 1996
Fig. 36



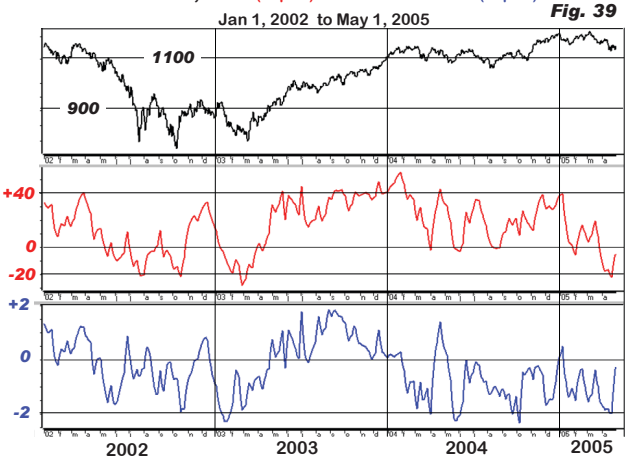
S&P 500, AAII (expo.10) & Purified AAII (exp10)
Jan 1, 1995 to June 1, 1998
Fig. 37



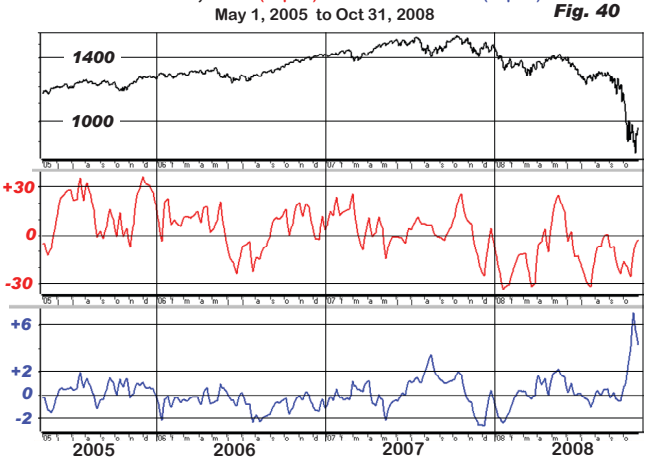
S&P 500, AAII (exp10) & Purified AAII (exp10)
June 1, 1998 to Jan 1, 2002
Fig. 38



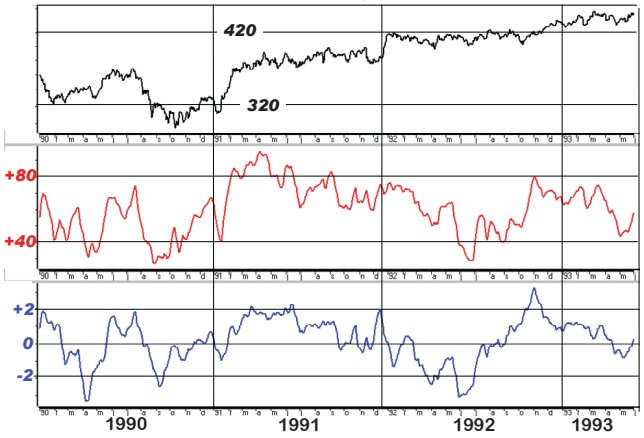
S&P 500, AAII (exp10) & Purified AAII (exp10)
Jan 1, 2002 to May 1, 2005
Fig. 39



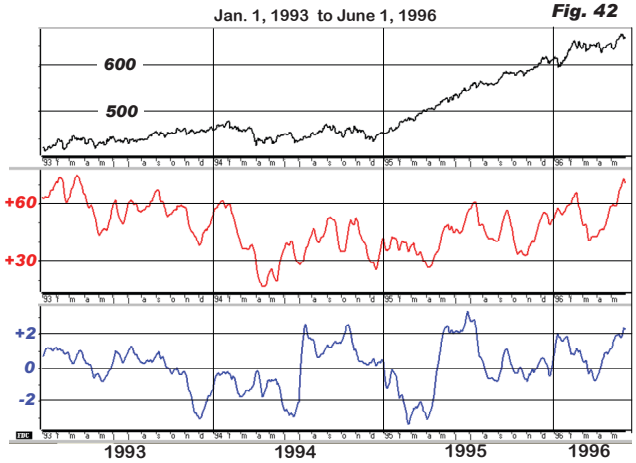
S&P 500, AAII (exp10) & Purified AAII (exp10)
May 1, 2005 to Oct 31, 2008
Fig. 40



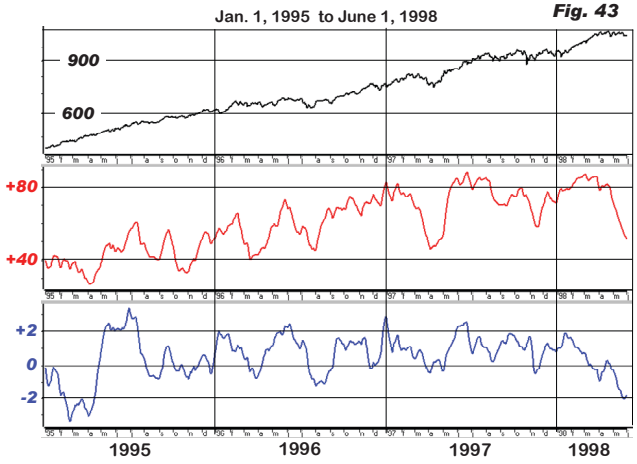
S&P 500, HUL (exp10) & Purified HUL (exp10)
Jan. 1, 1990 to Sept 1, 1993
Fig. 41



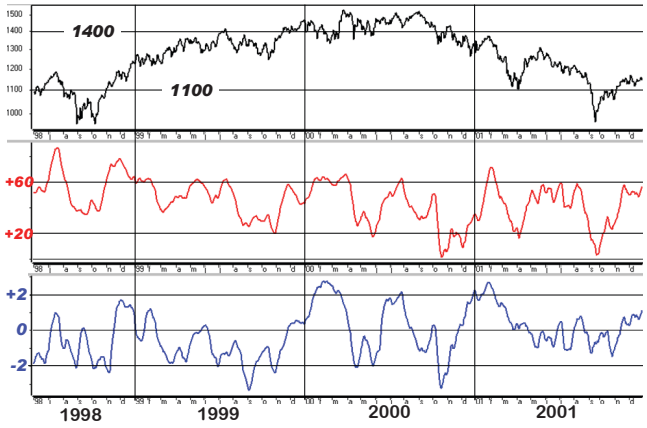
S&P 500, HUL (exp10) & Purified HUL (exp10)
Jan. 1, 1993 to June 1, 1996
Fig. 42



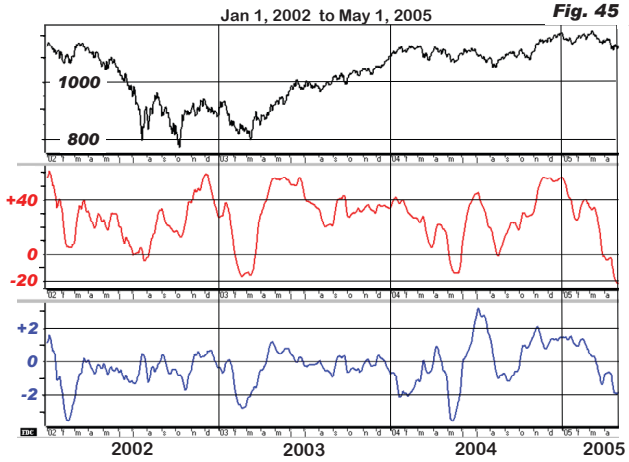
S&P 500, HUL (exp10) & Purified HUL (exp10)
Jan. 1, 1995 to June 1, 1998
Fig. 43



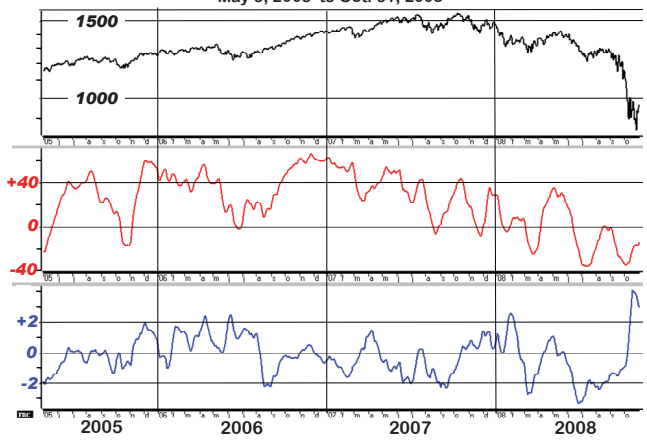
S&P 500, HUL (exp10) & Purified HUL (exp10)
June 1, 1998 to Jan. 1, 2002
Fig. 44



S&P 500, HUL (exp10) & Purified HUL(exp10)
Jan 1, 2002 to May 1, 2005
Fig. 45



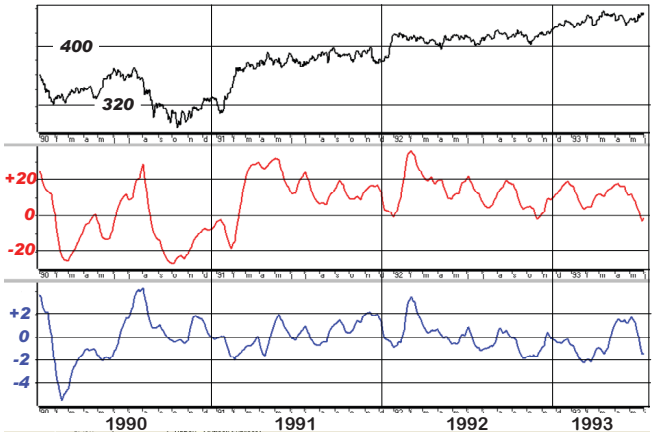
S&P 500, HUL (exp10) & Purified HUL (exp10)
May 3, 2005 to Oct. 31, 2008
Fig. 46



S&P 500, INV (exp10) & Purified INV (exp10)

Jan. 1, 1990 to Sept 1, 1993

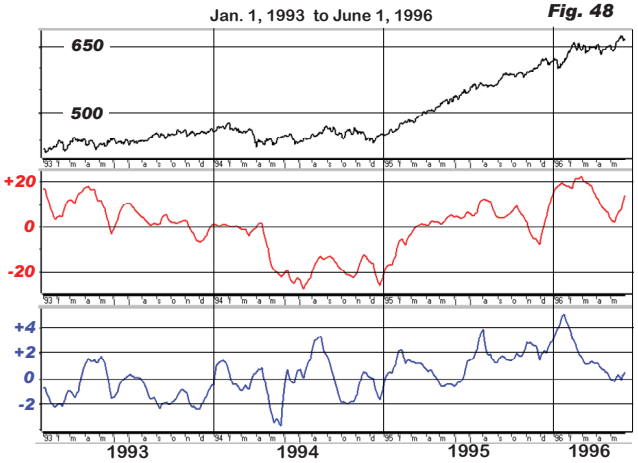
Fig. 47



S&P 500, INV (exp10) & Purified INV (exp10)

Jan. 1, 1993 to June 1, 1996

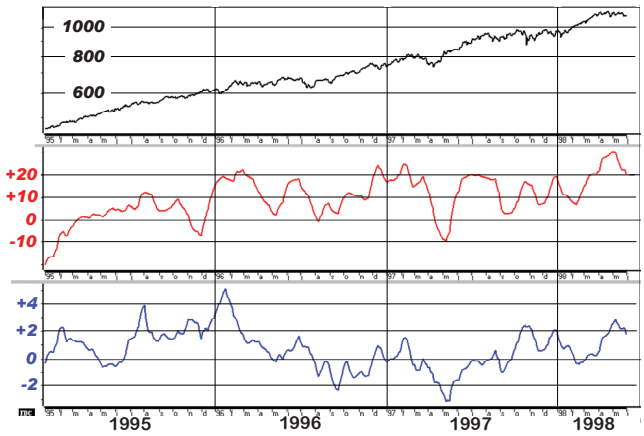
Fig. 48



S&P 500, INV (exp10) & Purified INV (exp10)

Jan. 1, 1995 to June 1, 1998

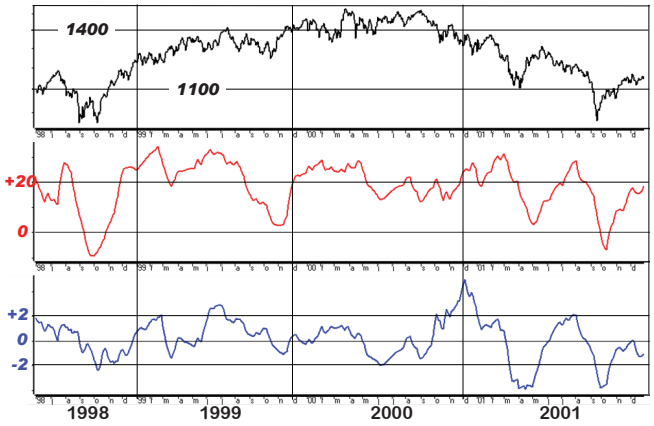
Fig. 49a



S&P 500, INV (exp10) & Purified INV (exp10)

June 1, 1998 to Jan. 1, 2002

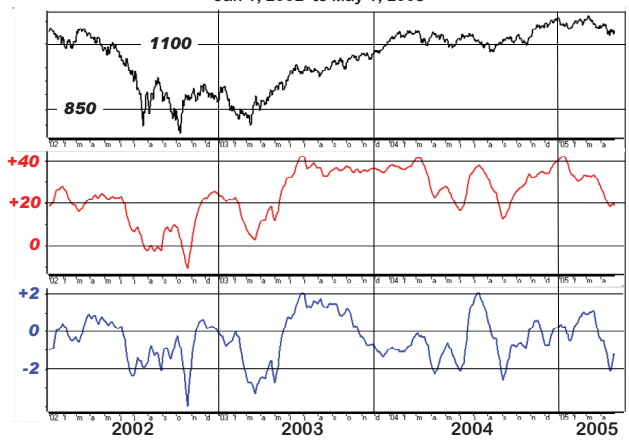
Fig. 49b



S&P 500, INV (exp10) & Purified INV(exp10)

Jan 1, 2002 to May 1, 2005

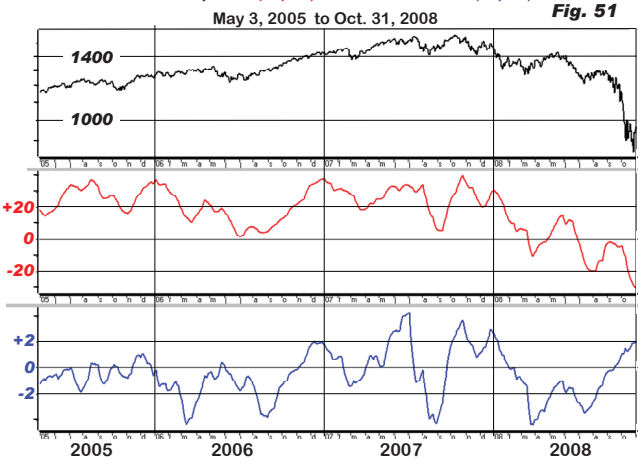
Fig. 50



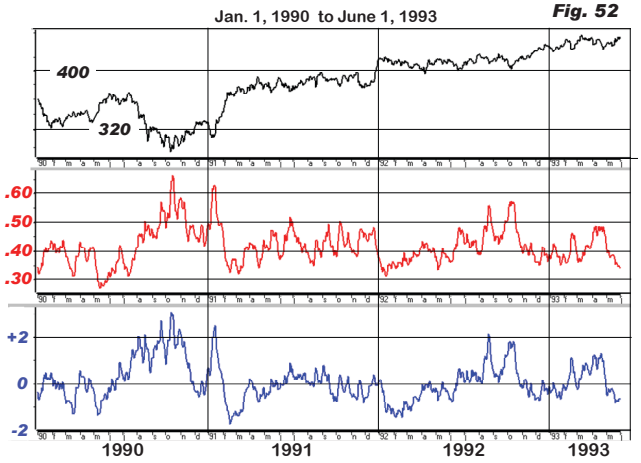
S&P 500, INV (exp10) & Purified INV (exp10)

May 3, 2005 to Oct. 31, 2008

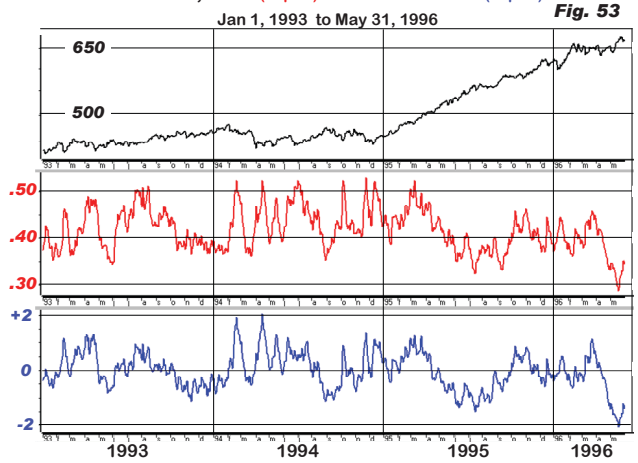
Fig. 51



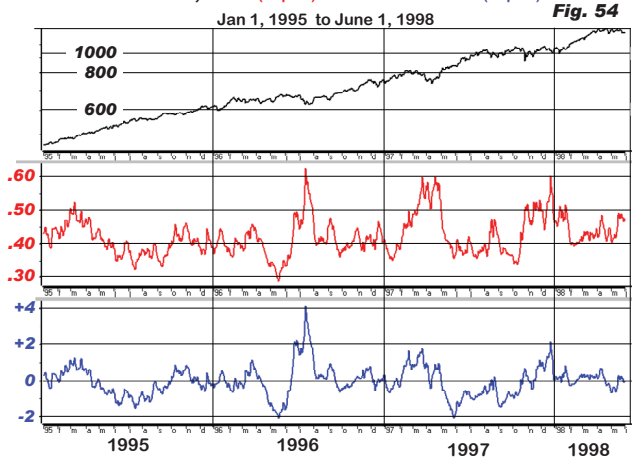
S&P 500, PCR (exp10) & Purified PCR (exp10)
Jan. 1, 1990 to June 1, 1993
Fig. 52



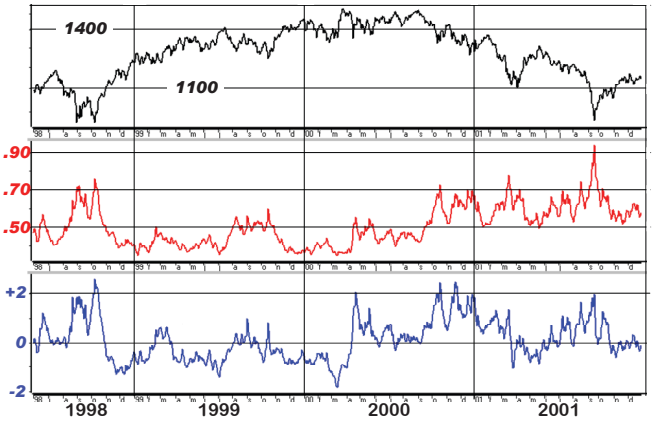
S&P 500, PCR (exp10) & Purified PCR (exp10)
Jan 1, 1993 to May 31, 1996
Fig. 53



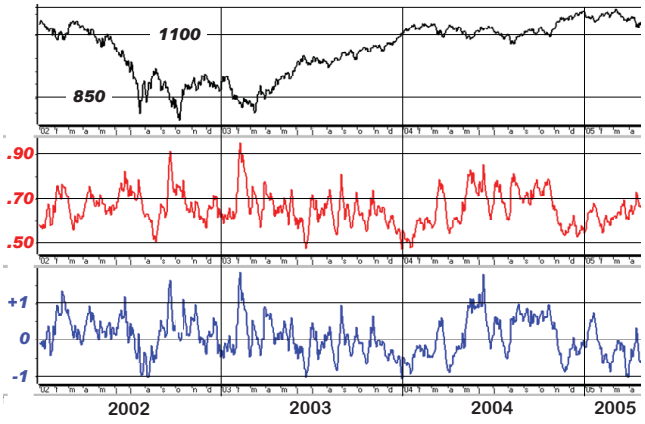
S&P 500, PCR (exp10) & Purified PCR (exp10)
Jan 1, 1995 to June 1, 1998
Fig. 54



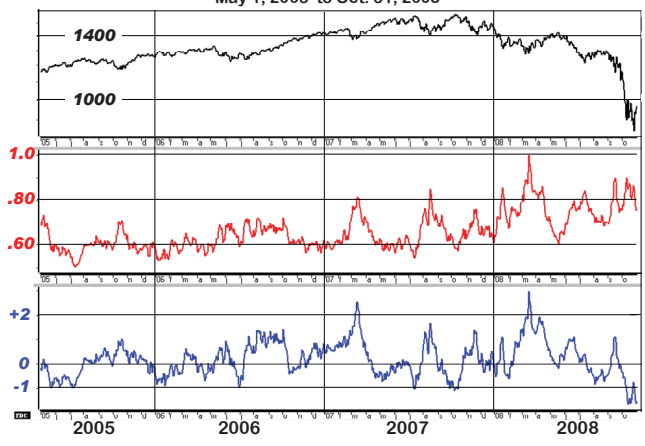
S&P 500, PCR (exp10) & Purified PCR (exp10)
June 1, 1998 to Jan 1, 2002
Fig. 55



S&P 500, PCR (exp10) & Purified PCR (exp10)
Jan 1, 2002 to May 1, 2005
Fig. 56



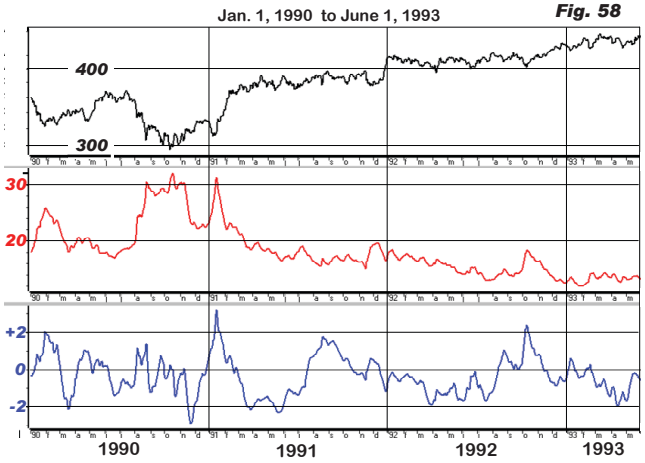
S&P 500, PCR (exp10) & Purified PCR (exp10)
May 1, 2005 to Oct. 31, 2008
Fig. 57



S&P 500, VIX (exp10) & Purified VIX (exp10)

Jan. 1, 1990 to June 1, 1993

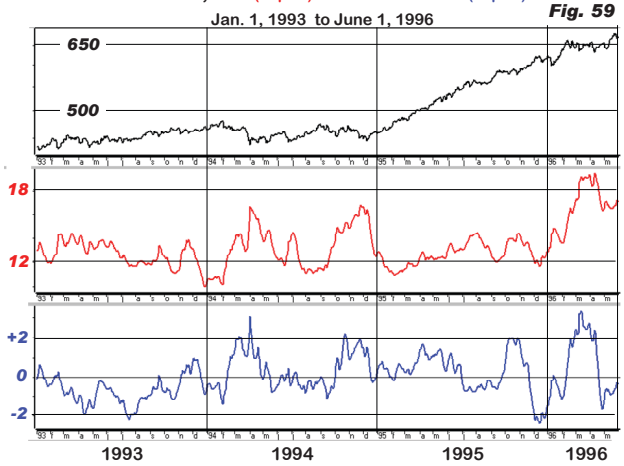
Fig. 58



S&P 500, VIX (exp10) & Purified VIX (exp10)

Jan. 1, 1993 to June 1, 1996

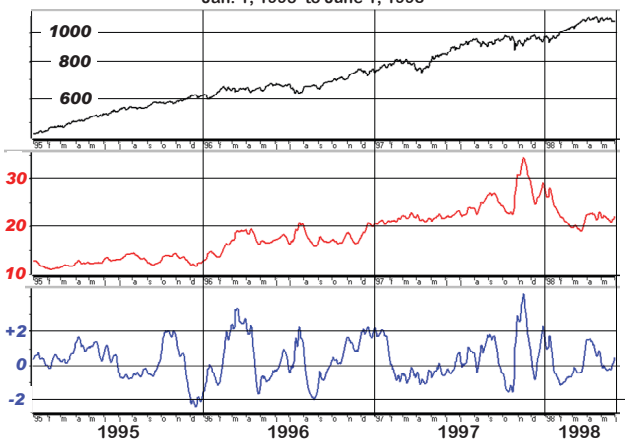
Fig. 59



S&P 500, VIX (exp10) & Purified VIX (exp10)

Jan. 1, 1995 to June 1, 1998

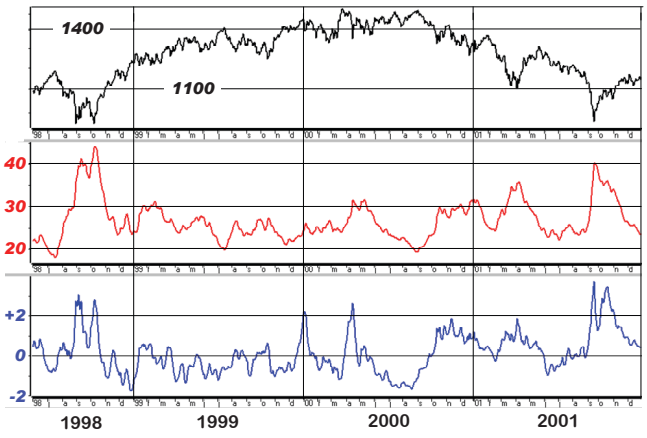
Fig. 60



S&P 500, VIX (exp10) & Purified VIX (exp10)

June 1, 1998 to Jan. 1, 2002

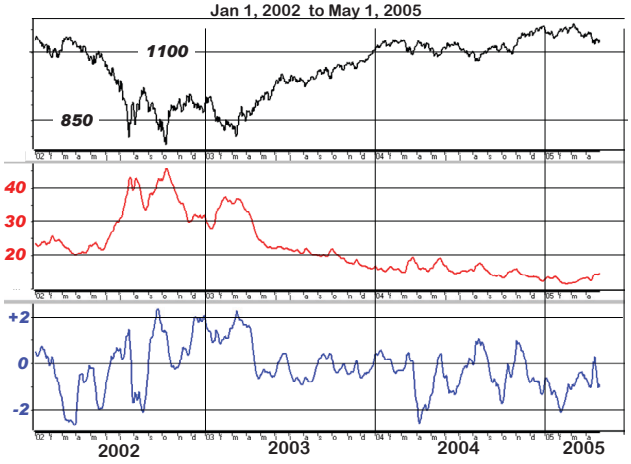
Fig. 61



S&P 500, VIX (exp10) & Purified VIX (exp10)

Jan 1, 2002 to May 1, 2005

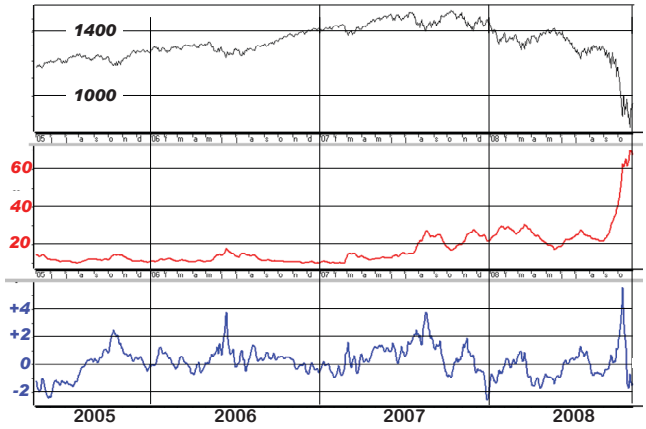
Fig. 62



S&P 500, VIX (exp10) & Purified VIX (exp10)

May 3, 2005 to Oct. 31, 2008

Fig. 63



About the Author

David R. Aronson, CMT
Adjunct Professor of Finance, Baruch College
Hood River Research, Inc.
&
John R. Wolberg
Professor of Mechanical Engineering
Technion, Haifa Israel POB 1809
Madison Square Station, New York, New York 10159

Does the Wave Principle Subsume all Valid Technical Chart Patterns?

3

Robert R. Prechter Jr., CMT

Abstract

This paper investigates whether the Wave Principle subsumes forms asserted in other types of pattern analysis. If the Wave Principle constitutes the primary market pattern, as proponents assert, then all other proposed patterns must either be spurious or fall within the structure of the Wave Principle. The conclusion is that technicians may reduce the large and varied catalogue of proposed market patterns down to five essential forms.

Abstract

This paper addresses the question of whether the Wave Principle model of the stock market (WP) is a set of patterns separate from those asserted in other forms of technical chart analysis. This paper is not intended to advance the case for chart patterns per se or to demonstrate their validity. It merely aims to establish a point about their relationship.

Few papers have addressed market patterns. Lo et al (2000) established the validity of the "head and shoulders" pattern; Prechter and Goel (2009) are conducting a statistical study relating to the validity of WP as opposed to stock market models popular in academia. But this paper's goal is merely qualitative in attempting to consolidate the field of chart pattern analysis so that statistical testers will have a firmer basis upon which to frame their studies.

If multiple sets of proposed market patterns exist, then the probability increases that they are all simply human constructs imposed upon random, chaotic or otherwise indefinite price movements in markets (see for example Loasby, 2000). Proponents of WP assert that it is *the primary* market pattern. Figure 0 displays this pattern and its five components. If so, then all other proposed market patterns must either be spurious or fall within the structure of WP. This paper attempts to identify those cases in which patterns are compatible with WP and those cases in which they are distinct from WP, and, if so, whether those patterns are valid.

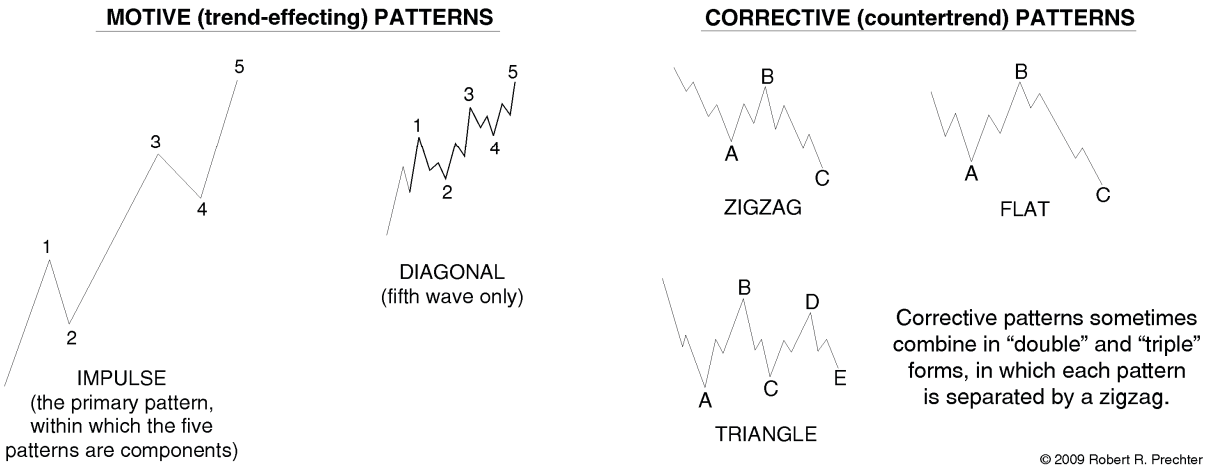
Traditional areas of technical analysis that depend upon market patterns are Dow Theory and chart formations as described in Edwards and Magee. Each of these areas is treated in turn.

I. Dow Theory

William Peter Hamilton, editor of *The Wall Street Journal* from 1902 to 1929, developed a list of tenets from the observations of market behavior published by the newspaper's founder, Charles H. Dow. He published a summary of these tenets in *The Stock Market Barometer* (1922). Investment analyst Robert Rhea refined those observations in *The Dow Theory* (1932).

Elliott read Rhea's book, so we may presume that some of the observations within Dow Theory led him to investigate market patterns of this type in the first place. When he saw error or superfluity, however, he said so and crafted his description of market behavior according to what he saw and what he thought mattered. As Collins put it, "Dow painted with broad strokes of the brush and Elliott in detail." (Frost & Prechter, p.13) Frost and Prechter claimed, "The Wave Principle validates much of Dow Theory, but of course Dow Theory does not validate the Wave Principle" (p.184), as the latter is a more comprehensive and detailed description

Figure 0



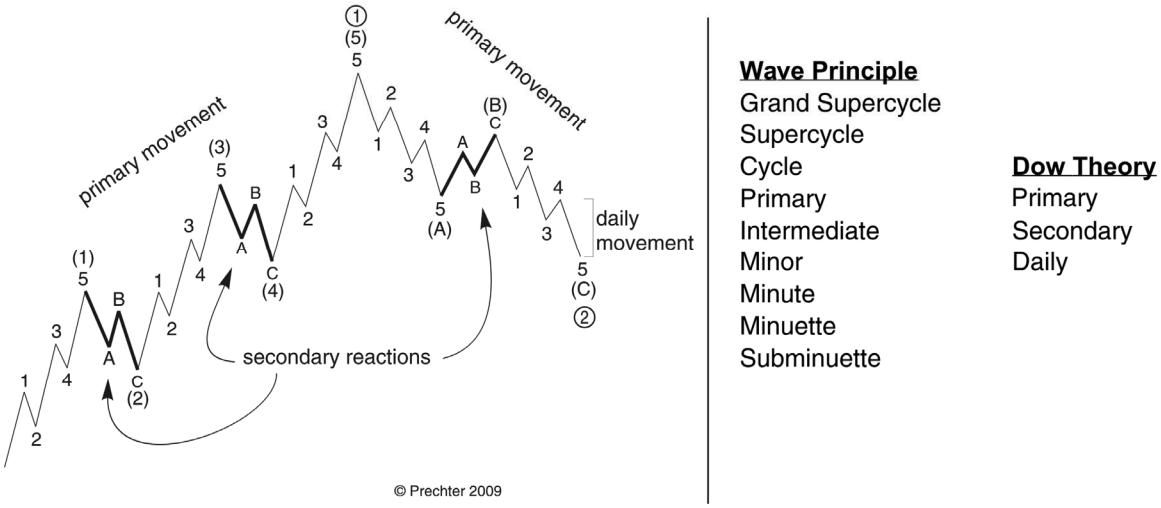
of market behavior and does not require two averages for analysis. There are six tenets of Dow Theory that matter for our purposes.[1] Those tenets and their associated observations fit — or fail to fit — into WP as follows:

A. Three Sizes of Market Movement

There are three sizes of market movement: "the day-to-day movement," called the "daily trend;" swings that last from "one month to three months," called the "secondary movement;" and "broad market movements [that] may continue for years and are seldom shorter than a year at least," called the "primary movement." (Rhea, p.33, quoting William Peter Hamilton)

Dow Theorists' observation of three sizes of trend constitutes a limited portion of Elliott's observation that the market's total movement comprises multiple degrees, or relative sizes, of trend. Dow Theory's primary, secondary and daily trends are rough expressions of Elliott's more specifically delineated Primary, Intermediate and Minor degrees. (See Figure 1.) Dow made his observations during a period when "bull markets" lasted only about two years on average, not decades, so the idea of even larger degrees apparently did not occur to him.

Figure 1. The Wave Principle and Dow Theory: Degrees of Trend

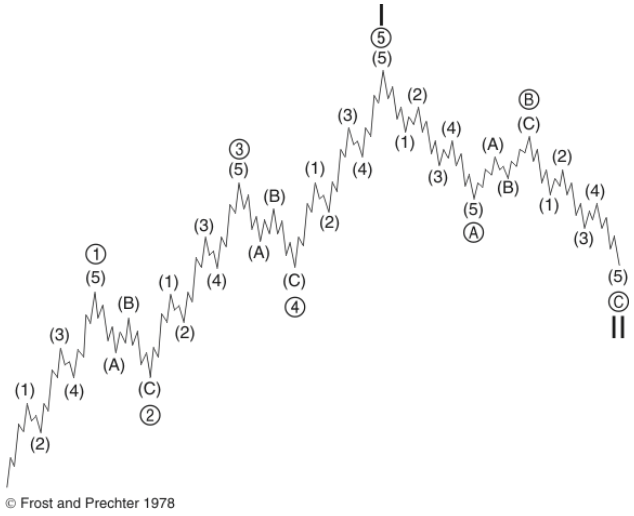


B. Secondary Reactions

Counter-trend swings lasting one to three months within a primary movement are called "secondary reactions." (Rhea, p.52)

Dow Theorists' observation that secondary reactions punctuate the primary trend is a quantitatively limited version of Elliott's observation that corrective waves punctuate motive waves at all degrees of trend, per Figure 2.

Figure 2. Corrective waves punctuate motive waves at all degrees of trend



C. Lines

A "line" is a period of narrow price action following a persistent trend. When prices move beyond the boundaries of a line, they tend to move significantly further in the same direction. (Rhea, p.79)

A "line" in Dow Theory equates to an elongated "sideways" correction under the Wave Principle, i.e., a "double three" or "triple three," per Figures 3 and 4. Frost and Prechter made this observation:

Corrective processes come in two styles. *Sharp* corrections angle steeply against the larger trend. *Sideways* corrections, while always producing a net retracement of the preceding wave, typically contain a movement that carries back to or beyond its starting level, thus producing an overall sideways appearance. (p.41)

Under WP, a sideways correction always precedes a resumption of the previous up or down trend. In contrast, under Dow Theory, a line may occur at the end of a trend; Edwards and Magee made the same claim for their sideways form, the "rectangle." These dual claims dilute the utility of such patterns. Under WP, lines occurring at market tops and bottoms are spurious patterns; see the discussion under "Rectangle."

Figure 3. Elongated sideways correction: A double three

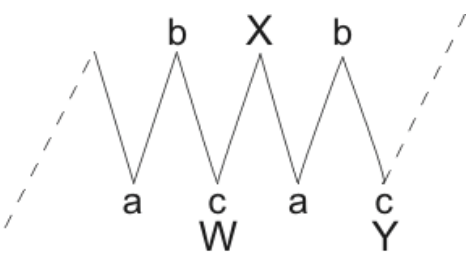
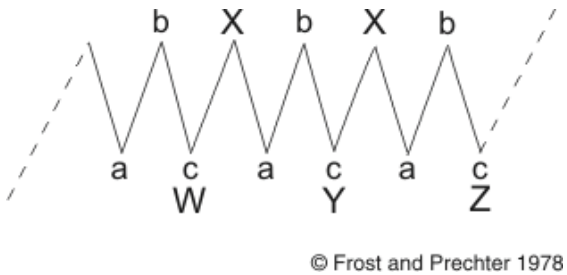


Figure 4. Elongated sideways correction: A triple three



D. Confirmation Between Indexes

Both the Dow Jones Industrial Average and the Dow Jones Transportation Average must "confirm" an ongoing primary bull or bear market by jointly making new highs or lows in each secondary movement that is in the direction of the primary movement. Otherwise, the primary trend is likely to reverse direction. (Rhea, p.68)

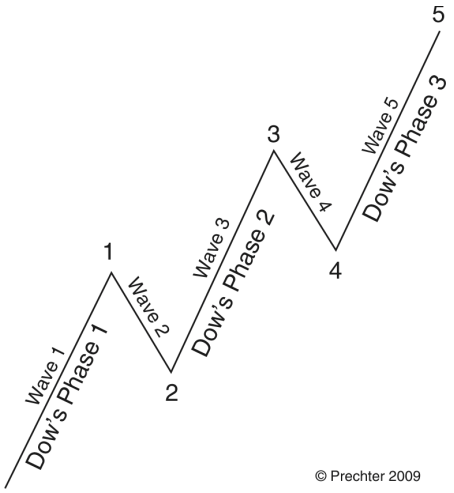
Elliott said, "The Wave Principle does not require confirmation by two averages. Each average, group, stock or any human activity is interpreted by its own waves." (1938, p.89) This statement does not challenge Dow Theory's observations about the confirmation or non-confirmation of its two averages, but it does say that dual-average confirmation or non-confirmation is not fundamental to market patterns. Every stock market top, for example, does not display a non-confirmation between the Industrials and the Transports, as Dow Theorists were disappointed to discover during the 1940s and 1950s. Nevertheless, as Frost and Prechter noted, "third waves," which are mid-trend waves, "are strong and broad," and "virtually all stocks participate in third waves." (p.80) In contrast, "fifth waves," which are ending waves, are "less dynamic than third waves in terms of breadth." (p.80) Speaking directly to the question at hand, they add, "When corrective and ending waves are in progress, divergences, or non-confirmations, are likely." (p.183) This is a broad statement that includes divergences in "momentum indicators" — which measure breadth, the speed of price change and other trend factors — and non-confirmations between or among the indexes of market prices under observation. Therefore, Dow Theory's observation about confirmations and non-confirmations of two particular averages are subsumed under WP and serve in the position of a guideline but not a rule of market action.

E. Bull Market Phases

"There are three phases of a bull period. [They are psychological and reflect] reviving confidence in the future of business...the response of stock prices to the known improvement in corporation earnings [and] a period when stocks are advanced on hopes and expectations." (Rhea, p.13)

Dow's "three phases of a bull period" are equivalent to the three motive waves within a larger motive wave under the Wave Principle, per Figure 5. Their psychological aspects are essentially identical, as described in *Elliott Wave Principle*. (Frost & Prechter, pp.78-81) Specifically, in advancing third waves (Dow's second phase), "increasingly favorable fundamentals enter the picture as confidence returns,"[2] and in advancing fifth waves (Dow's third phase), "optimism runs extremely high" (Frost & Prechter p.80). So the descriptions under each heading are compatible.

Figure 5. Dow's "three phases of a bull period" are equivalent to the three motive waves within a larger motive wave under the Wave Principle



F. Bear Market Phases

"There are three principal phases of a bear market. [They are] the abandonment of hopes [typical of the third bull phase,] selling due to decreased business and earnings [and] distress selling of sound securities, regardless of value." (Rhea, p.13)

WP challenges Dow Theory's claim that there are "three principal phases of a bear market." WP describes only two essential declining waves — A and C — within corrections. Some corrections, specifically triple zigzags, triple threes and triangles, sport three or more downward waves, but the simpler forms do not (see Frost and Prechter, pp. 41-54). One may characterize Dow's "third phase" as a description of investors' apparent motivation during the latter portion of a corrective wave, per the notes on Figure 6. Dow Theory's second phase is inadequate for delineating any such purported middle phase of a bear market. Business conditions usually continue to deteriorate further during Dow Theory's "distress" phase of a bear market and in fact beyond (see Figure 7), so there is no actual delineation between a second and third phase with respect to that presumed motivating factor. Observe further in Figure 7 that in two cases (1937-1942 and 1959-1962) a recession occurred during wave A, not wave C, counter to the presumption of Dow Theory that business conditions are always worse after the first phase of a bear market.

Figure 6. How Dow's bear market observations relate to a zigzag

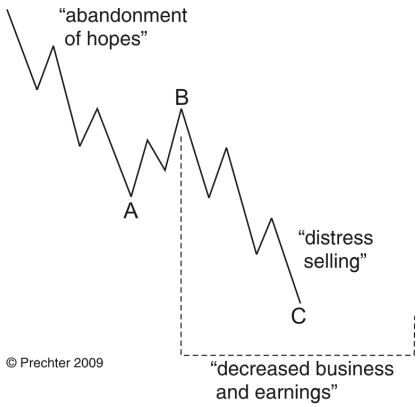
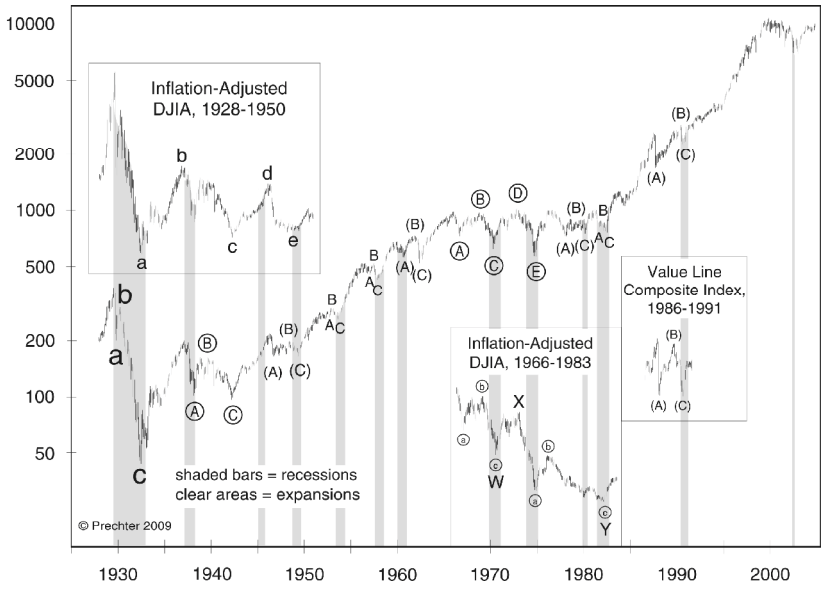


Figure 7. Elliott wave correction and economic recessions



The Wave Principle, then, subsumes five of the six listed tenets of Dow Theory and challenges the remaining one (as well as two other significant claims, per Endnote 1). Dow Theorists' comments on trading volume are similar to Elliott's, and their comments on double tops and bottoms are similar to those of Edwards and Magee (see next section). These are not tenets of Dow Theory so much as adjunct observations of market behavior. Thus, the Dow Theory offers no challenge to Elliotticians' claim that the Wave Principle is the primary market pattern; indeed, its observations fit well within it.

II. Chart Patterns

The acknowledged "bible" of traditional chart interpretation is *Technical Analysis of Stock Trends* (1948) by Robert Edwards and John Magee. The book has sold continuously since it was published. The discussion here utilizes the fifth edition (1966).

Edwards and Magee collected others' observations about chart patterns and added their own, producing a comprehensive list of forms (E&M) against which we may compare related aspects of WP. It may not appear necessary to undertake this exercise, as these authors observed and displayed these patterns exclusively in charts of *individual stocks*, not in the averages where WP is deemed best to apply. Nevertheless, because many chartists use the same forms for general market interpretation and since WP has some applicability to individual stocks (Frost & Prechter, pp.169-173), this exercise is important in order to determine if there are any valid market patterns outside the forms of WP.

We will examine each chart pattern under E&M and determine whether it falls within the net of Elliott's observations. To simplify this presentation, we limit our prose and let the graphs speak for themselves to the extent possible.

A. Head and Shoulders Top

Figure 8a shows Edwards and Magee's depiction of a head and shoulders top, and Figure 8b is taken from *Elliott Wave Principle* (Frost & Prechter, p.194, Figure 7-4). In idealized wave development, wave five of 3 and wave 4 form the "left shoulder" of the pattern, wave 5 and wave A form the "head," and wave B and wave one of C form the "right shoulder." Wave two of C creates the return to the neckline that is typical of the pattern. In other words, head and shoulders patterns form naturally within Elliott waves.

Figure 8a. Head and shoulders top per Edwards and Magee

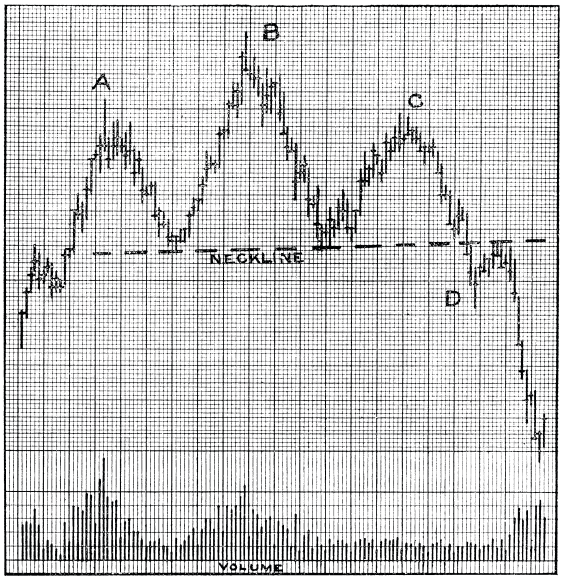
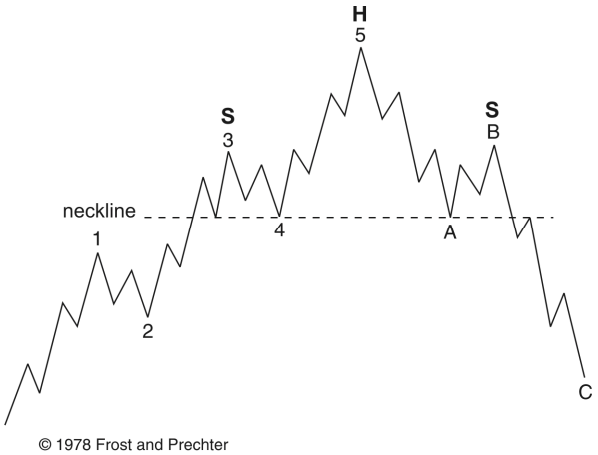


Figure 8b. The Wave Principle accommodates a head and shoulders top



B. Head and Shoulders Bottom

A head and shoulders bottom is formed nearly the same way. Within wave C, wave five of 3 and wave 4 form the left shoulder, wave 5 of C and wave 1 form the head, and wave 2 and wave one of 3 form the right shoulder. Figures 9a and 9b show the same result from a different set of waves in which waves five of A and wave B form the left shoulder, wave C and wave 1 form the head, and wave 2 and part of wave one of 3 form the right shoulder.

Figure 9a. Head and shoulders bottom per Edwards and Magee

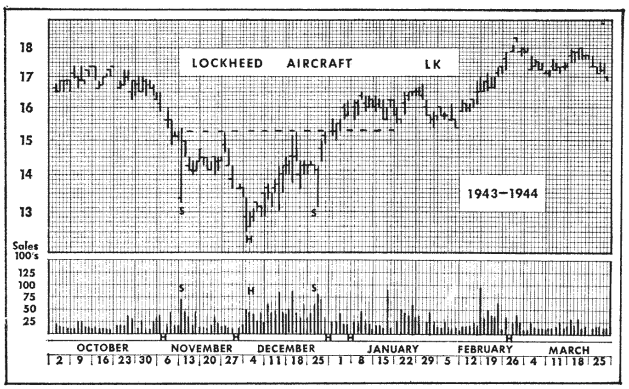
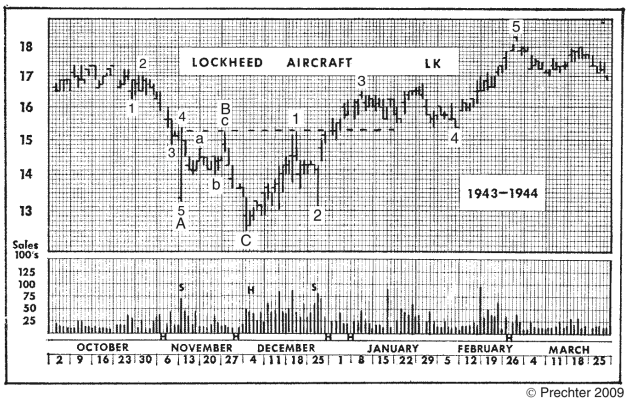


Figure 9b. Same graph as 9a, with Elliott wave labels



C. Rounding Bottom

Edwards and Magee list both "rounding bottoms" and "rounding tops," but they give no illustrations of real-life rounding tops, perhaps because they could not find one. The authors do show several examples of rounding bottoms, for example the one shown in Figure 10a. As revealed in Figure 10b, however, on log scale prices fluctuate between the straight lines of a trend channel, per WP. Therefore, E&M's purported form may be simply an artifact of using arithmetic scale for large movements in price. In other words, these apparent patterns are probably spurious.

Figure 10a. A rounding bottom as described by Edwards and Magee.

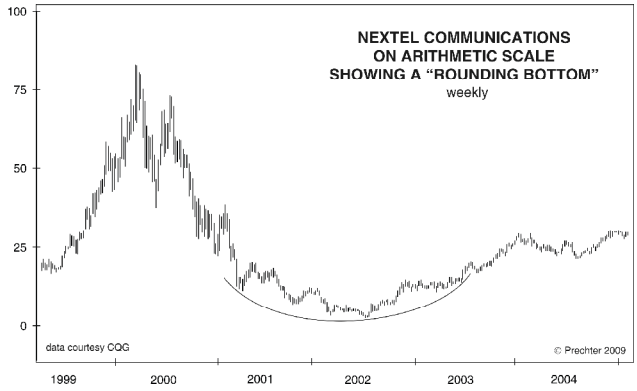
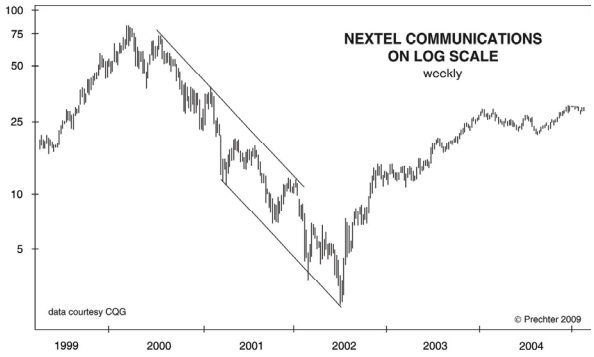


Figure 10b. Conforms to straight lines on log scale; abrupt reversal



D. Scallops

Edwards and Magee claim, "When a stock...emerges from a long-time bottom...it will often make a long Major advance in a series of 'saucers.'" (p.184) As with the "rounding bottom," this development is simply an artifact of arithmetic scaling when prices emerge from a low level. There is no evidence to indicate that this

supposed pattern is other than spurious. Figure 11a shows an example of Edwards and Magee's "scallops." Figure 11b re-graphs the same data on log scale, in which the rounded forms disappear and prices conform to straight lines.[3]

Figure 11a. Scallops, as described by Edwards and Magee.

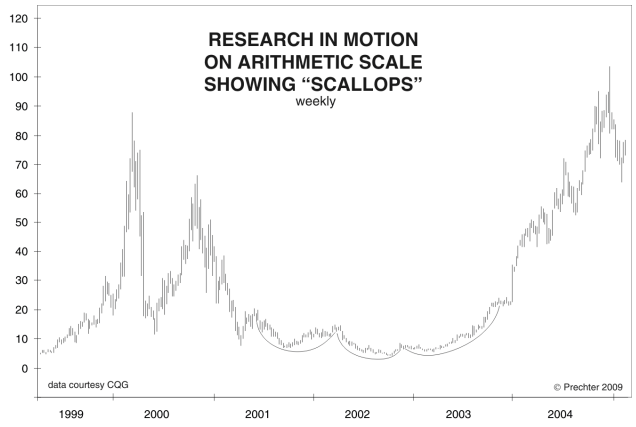


Figure 11b. Conforms to straight lines on log scale; abrupt reversal

E. Symmetrical Triangle

WP subsumes a specific version of E&M's "symmetrical triangle."[4] As you can see in Figures 12a and 12b, Edwards and Magee's example is a perfect rendition of Elliott's description, right down to the five subwaves.

Figure 12a. A symmetrical triangle per Edwards and Magee

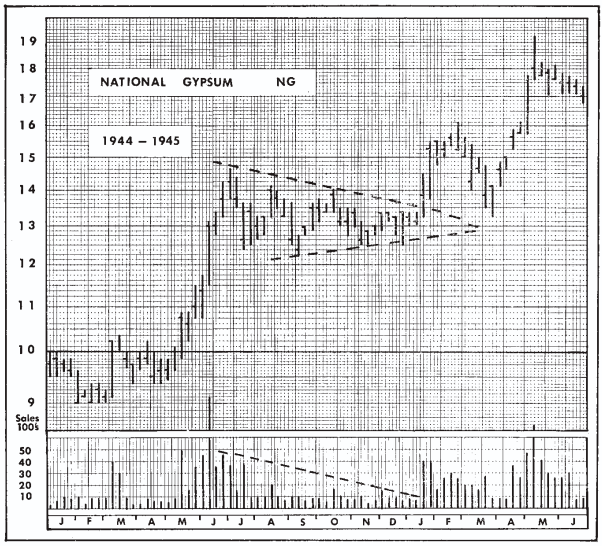
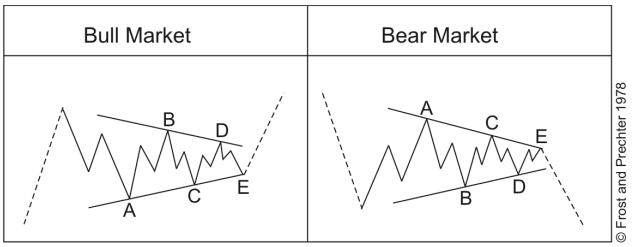


Figure 12b. Symmetrical, or "contracting", triangles per the Wave Principle



Under E&M, "Prices may move out of a Symmetrical Triangle either up or down. There is seldom if ever... any clue as to the direction..." (Edwards & Magee, p.92) Elliott's form is more specifically defined, and its position in the market structure and therefore its implications are more definite.

Elliott observed that triangles occur only as or within corrections, per the labeling in Figure 12c, where one appears as a wave 4 correction. E&M includes triangles at bottoms and tops as well, but as you can

see in Figure 12d,[5] such apparent triangles may be seen as epiphenomena attending normal Elliott wave development at market tops and bottoms. Elliott stated, "All waves in a triangle must be part of a movement in one direction [i.e., a single correction]; otherwise the 'triangle' is only a coincidence." (1939, p.173) E&M includes no evidence to counter this conclusion.

Figure 12c. A proper contracting triangle, as a wave 4 correction

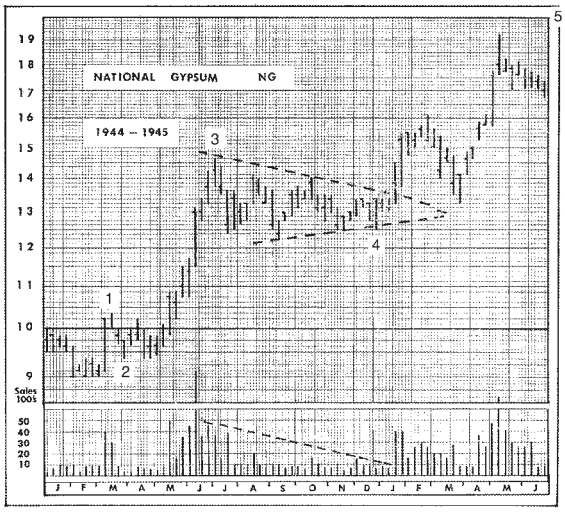
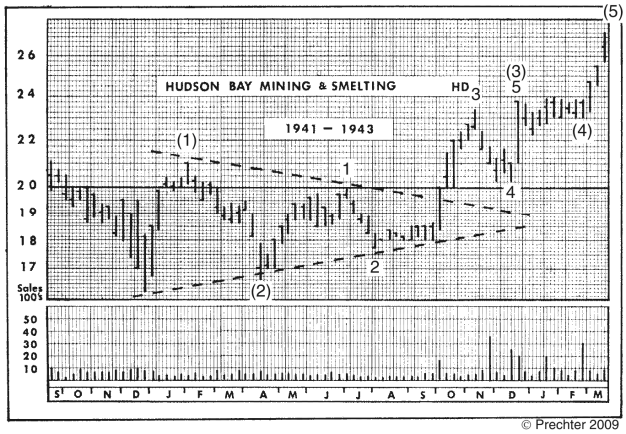


Figure 12d. A spurious contracting triangle under the Wave Principle



F. Ascending Triangle

The chartists' and Elliott's ascending triangles are nearly identical in general form and implication, per Figure 13a. Edwards and Magee affirm, as did Elliott, that "they give advance notice of their intentions" (p.102) for subsequent price movement. The main difference between the two ideas is that triangles under WP always occur as or within corrections such as in Figure 12c, while chartists also see them in places that Elliotticians would view as epiphenomena attending normal Elliott wave development. Figure 13b is an illustration from Edwards and Magee showing a purported ascending triangle between dashed lines. I have added wave labels to show that this apparent form has nothing to do with an ascending triangle under WP, either in form (it has only three subwaves) or position. Regardless, the forms under WP subsume the chartists' triangles.

Figure 13a. Ascending triangle per the Wave Principle

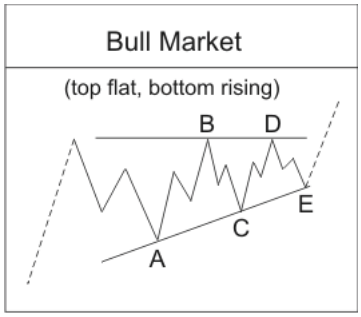
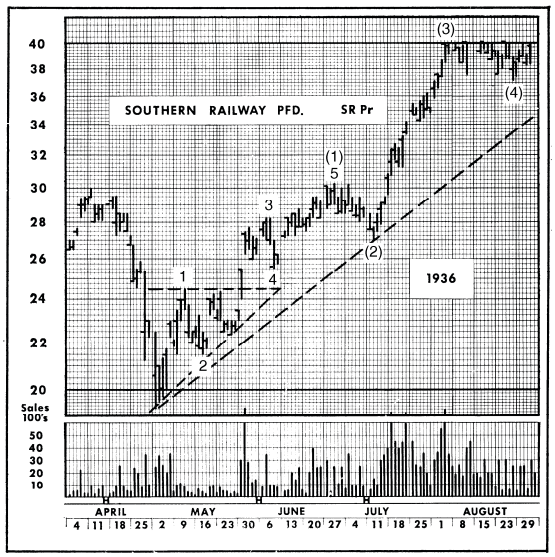


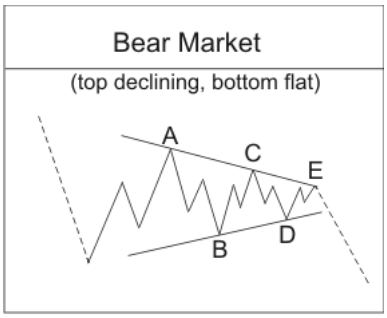
Figure 13b. A spurious ascending triangle



G. Descending Triangle

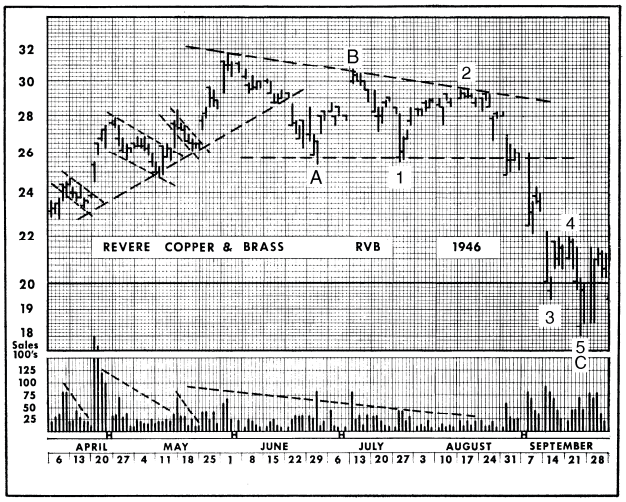
Comments under "Ascending Triangle" pertain equally to descending triangles. See Figures 14a and 14b.

Figure 14a. Descending triangle per the Wave Principle



© Frost and Prechter 1978

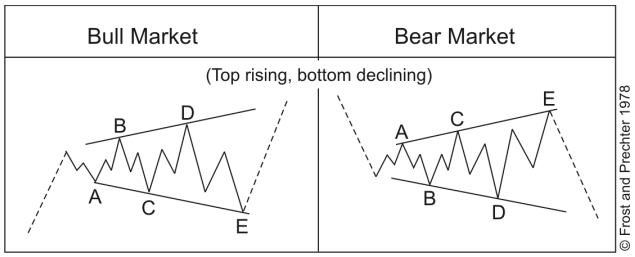
Figure 14b. A spurious descending triangle



H. Broadening Formation

Edwards and Magee's "broadening formation" is a general description of Elliott's more specifically defined "expanding triangle." Elliott's triangle, as depicted in Figure 15a, "always occurs in a position prior to the final actionary wave in a pattern" (Frost & Prechter, p.51), i.e. just before a top or bottom. Edwards and Magee observe the same thing about the broadening formation, which "develops most frequently in the later and more 'excited' stages of a Primary Bull Market." (p.141) Figure 15b shows a close-up of a real-life example of Elliott's expanding triangle. Figure 15c shows its position in the larger pattern, showing that it occurred in the position that both Edwards and Magee and R.N. Elliott described. Figure 15d shows one of Edwards and Magee's examples of a "broadening formation." Elliott wave labels are added to show that again it occurs in the position that Elliott and Edwards and Magee described.[6]

Figure 15a. Expanding triangle per the Wave Principle



© Frost and Prechter 1978

Figure 15b. An actual expanding triangle (solid lines); false rectangle (dashed lines)

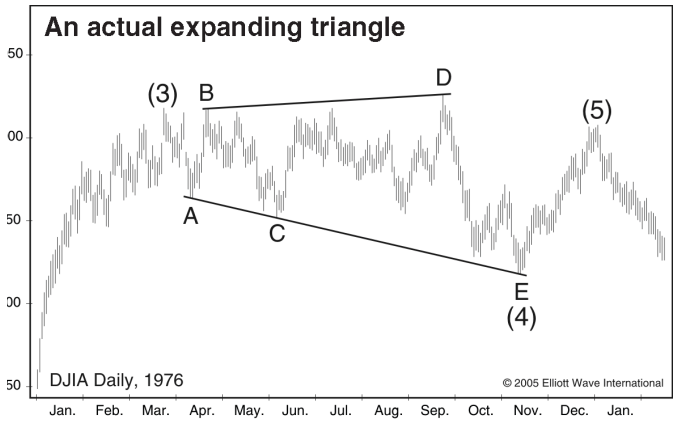


Figure 15c. The expanding triangle in context

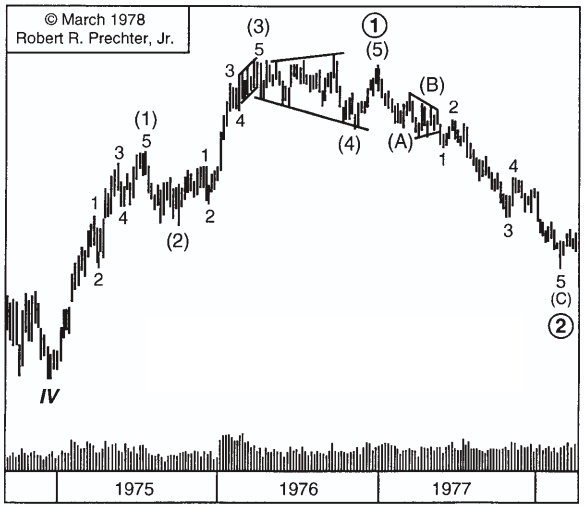
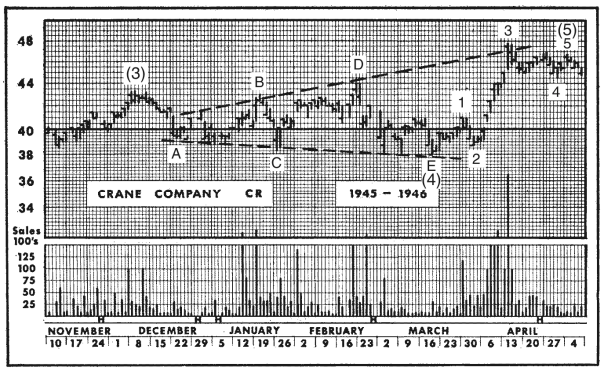


Figure 15d. Edwards and Magee's expanding triangle, labeled as wave (4)



I. Rectangle

The chartist's rectangle is Elliott's "double three" correction, per Figures 16a and 16b. E&M also catalogues rectangles at tops and bottoms, but again these may be deemed a spurious pattern imposed upon normal wave development. An example is the apparent rectangle from February through September of 1976 shown in Figure 16c, which is properly depicted in Figure 15b as part of an expanding triangle.

Figure 16a. Elliott's sideways corrections are equivalent to chartists' rectangles

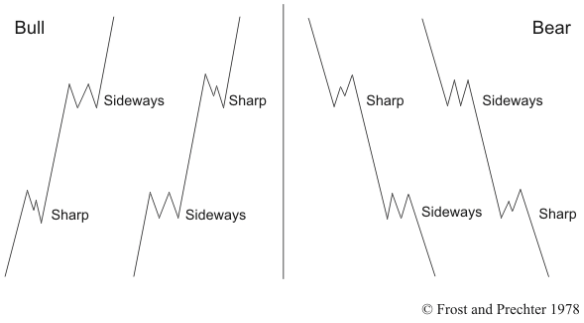


Figure 16b. Edwards and Magee's rectangle as a flat correction.

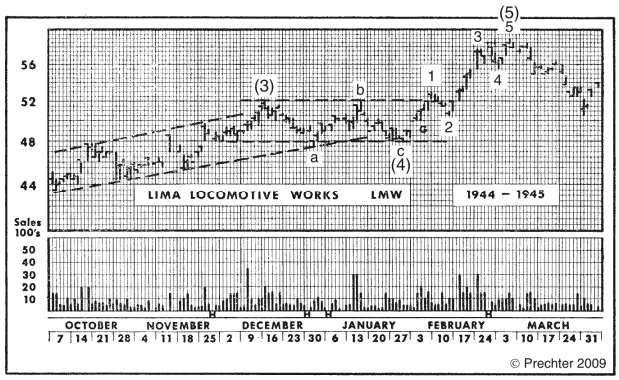
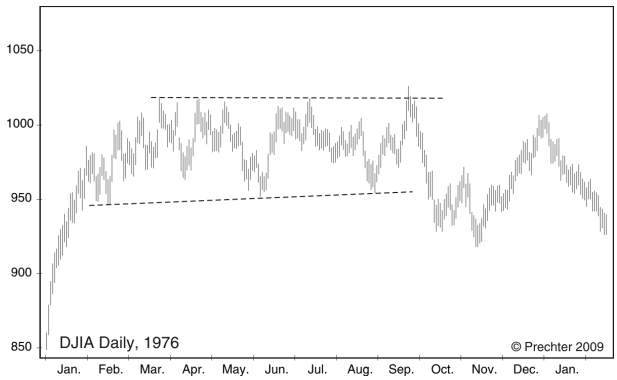


Figure 16c. Outline of a rectangle



J. Double and Triple Tops and Bottoms

According to E&M, double and triple tops and bottoms are four distinct patterns. According to WP, these are not distinct patterns but merely the occasional result of certain quantitative relationships among two or more waves near the termination of a larger wave. Supporting that conclusion are Edwards and Magee's own words: "True Double Top and Bottoms are exceedingly rare; Triple forms are even rarer." (p.128) In the unusual circumstances when wave 5, C or A is relatively short and/or wave 2 or B is relatively long, the market has the appearance of a double or triple top or bottom. Figure 17a shows Elliott wave labels imposed upon Edwards and Magee's example of a double bottom. Figure 17b does the same thing (the added solid line delineates a triangle) with their example of a triple top, which is rather strained given that the peaks actually occur at three different levels. In other words, Edwards and Magee's words and illustrations support the case that double and triple tops and bottoms are artifacts of waves, not independent patterns.

Figure 17a. Elliott wave labels on a double bottom

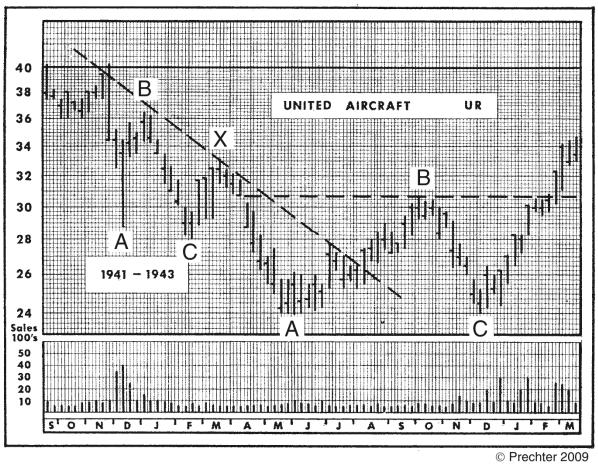
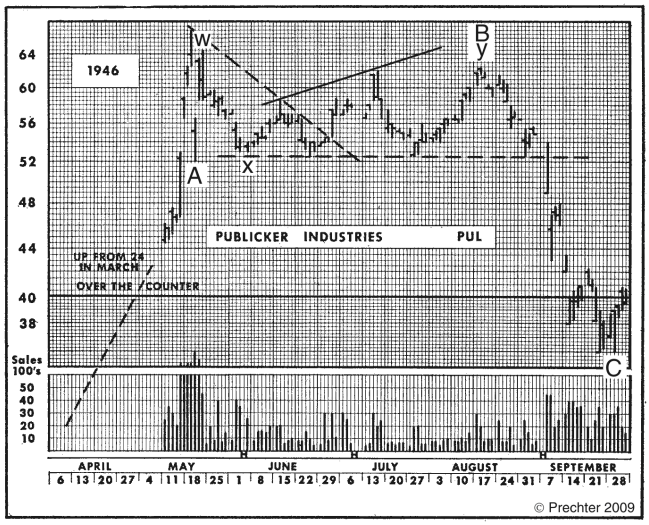


Figure 17b. Elliott wave labels on a triple top



K. Diamond

Like the rectangle, "the Diamond is not a common pattern." (Edwards & Magee, p.153) Under WP, the diamond, which typically occurs near market tops, is an epiphenomenon attending occasional times when ending waves are clustered. Figure 18a is a graph from Edwards and Magee showing a diamond. The attendant Elliott wave labels are superimposed upon it. A mid-trend diamond, such as Edwards and Magee saw in at least one instance, can result from a complex corrective wave such as the one illustrated in Figure 18b.

L. Falling or Rising Wedge

A wedge is a formation in which "the price fluctuations are confined within converging straight (or practically straight) lines, but differing from a triangle in that both boundary lines either slope up or slope down." (Edwards & Magee, p.155) This general description is part of Elliott's more specific description of a "diagonal triangle." Figure 19a shows Elliott's depiction of a diagonal triangle. Figure 19b shows Edwards and Magee's example of a wedge at the end of a trend. Elliott wave labels are added to show that WP accounts for this example.

Figure 18a. Elliott wave labels incorporating a flag, a diamond, and a symmetrical triangle

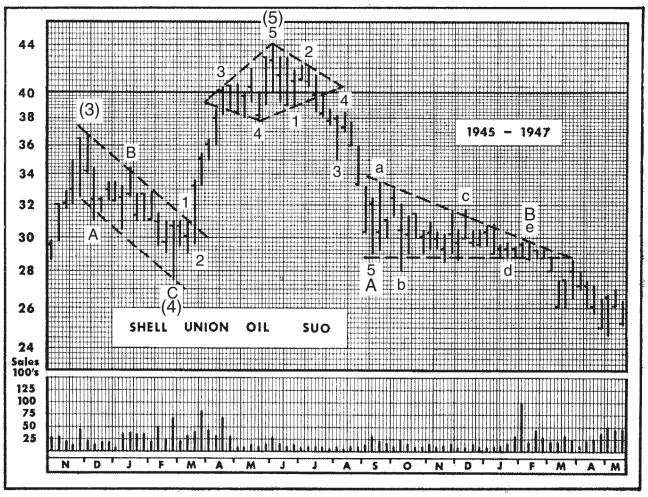


Figure 18b. A double-three correction with the appearance of a diamond

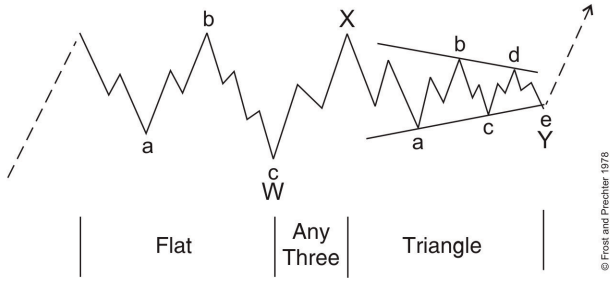


Figure 19a. A diagonal triangle

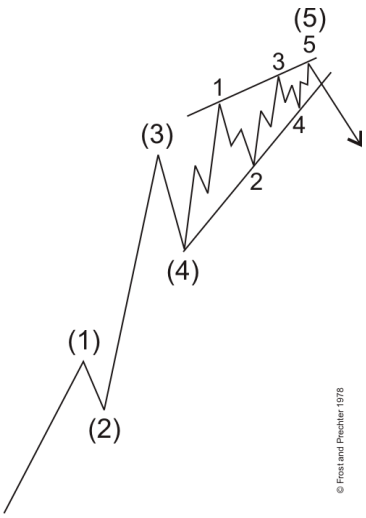
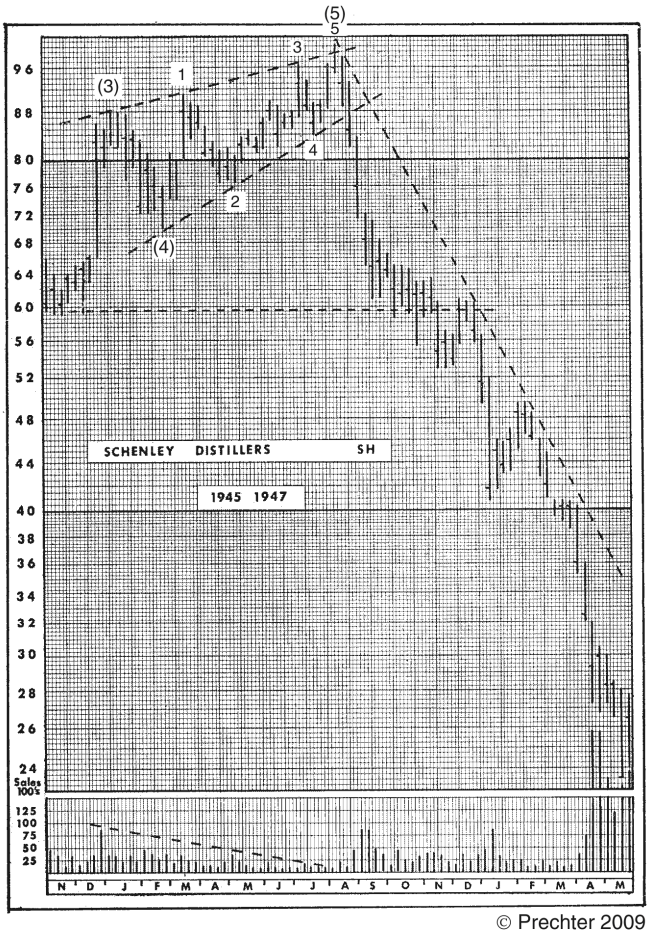


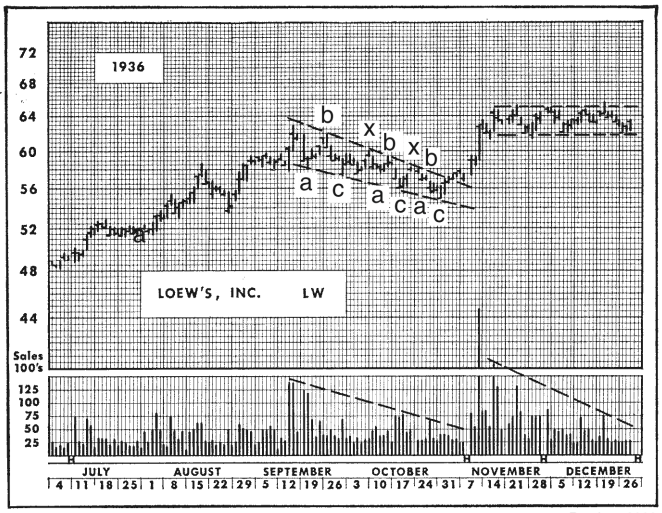
Figure 19b. A rising wedge labeled as a diagonal triangle



M. Pennant

The appearance of a wedge intra-trend, which E&M calls a pennant, may outline the shape of a single, double or triple zigzag under the Wave Principle. Figure 19c is from Edwards and Magee, with Elliott wave labels added to reveal a triple zigzag.

Figure 19c. A pennant labeled as a triple zigzag.

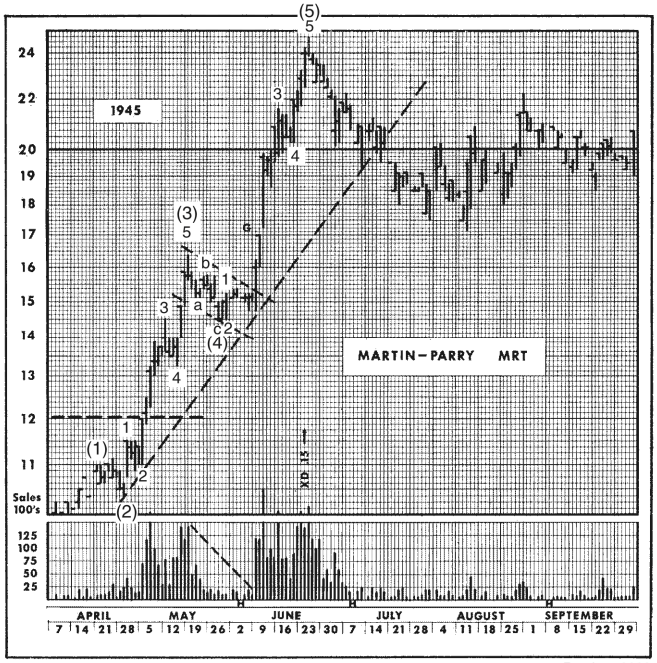


© Prechter 2009

N. Flag

A flag "looks like a flag on the chart...It might be described as a small, compact parallelogram of price fluctuations..." (Edwards & Magee, p.169) This is another example of a general form that may be imposed upon Elliott's more specific forms. Figure 20 is a chart from Edwards and Magee, with labels added to show how well it depicts an Elliott wave. The "flag" is simply two boundary lines around a zigzag and waves 1-2, i-ii of the next advance. Most examples from Edwards and Magee's book are single, double or triple zigzags under WP.

Figure 20. A flag labeled in Elliott wave context



© Prechter 2009

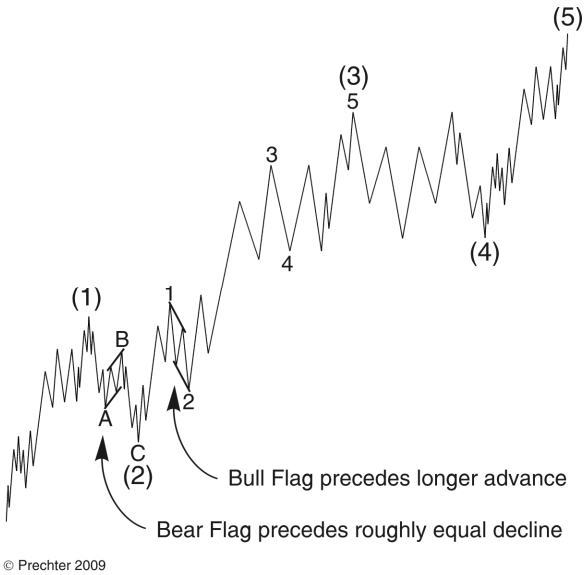
O. Measured Move

WP describes certain quantitative relationships. One of them is that in impulses, wave 3 is almost always longer than wave 1. Another is that in zigzags, waves A and C tend to be about equal in terms of price extent. These two observations are echoed in these words from Edwards and Magee about forecasting the extent of a move following a flag or pennant:

In applying the measuring rule, go back to the beginning of that immediately preceding move...and measure from there to the Minor reversal level at which the Flag or Pennant started to form. Then measure the same distance from the point where prices break out of the Flag or Pennant, and in the same direction. The level thus arrived at is the minimum expectation of this type of Consolidation pattern. As a matter of fact, advances from Flags or Pennants in an up trend generally go farther (in terms of points or dollars) than the preceding move, while declines may not carry quite so far. (p.177)

The fact that "advances...in an up trend generally go farther than the preceding move" is compatible with Elliott's observations that third waves in impulses are typically longer than first waves. Once the flag or pennant for wave 2 is complete, the next move is typically longer. The fact that "declines may not carry quite so far" is compatible with Elliott's observation that in corrections, the two downward waves are about equal. Once wave B is complete, wave C is typically much shorter than a third wave would be. Figure 21, "A Realistic Elliott Wave," is reprinted from *The Wave Principle of Human Social Behavior* (1999). Observe that the first "flag" delineated, wave B, precedes a wave C *decline*, which is the *same length* as wave A, a moderate move. The second "flag" delineated, wave 2, precedes a wave 3 *advance*, which is *longer* than wave 1. Elliott's detailed observations encompass Edwards and Magee's more general ones.

Figure 21. A realistic Elliott wave: The "measured move" works in corrections but not in impulses



P. Gaps

Edwards and Magee describe (1) "common" or "area," (2) "breakaway," (3) "continuation" or "runaway" and (4) "exhaustion" gaps. A single observation under the Wave Principle accounts for the first three types of gaps:

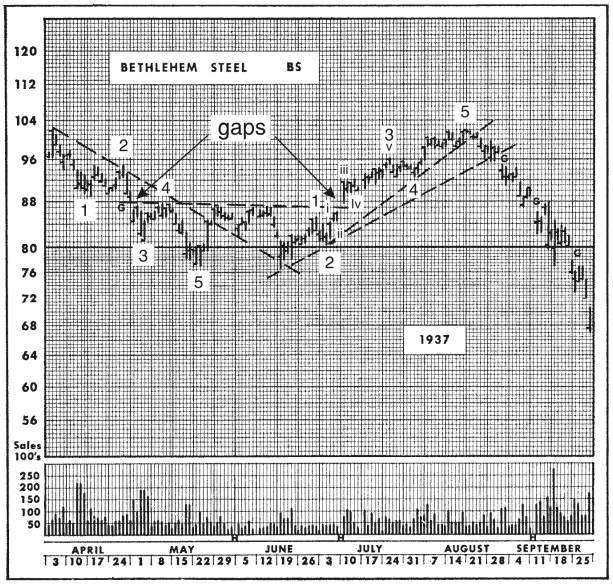
"High volume and volatility (gaps) are recognized characteristics of 'breakouts,' which generally accompany third waves..." (Frost & Prechter, p.195)

"...the third wave of a third wave, and so on, will be the most volatile point of strength in any wave

sequence. Such points invariably produce...'continuation' gaps..." (p.80)

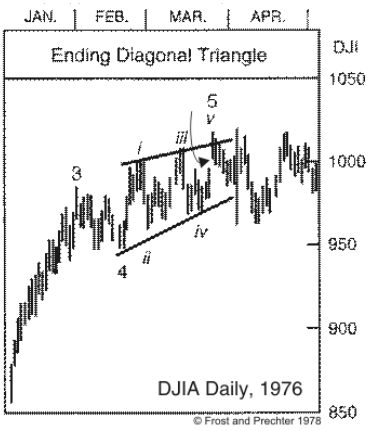
Edwards and Magee's examples of area and breakaway gaps all occur at the "third of the third" wave, i.e., roughly in the middle of a trend. Figure 22 is one of Edwards and Magee's examples of a breakaway gap, with labels added to show its appearance precisely at the "third wave of a third wave" position. An area gap occurs within sideways corrections precisely where Frost and Prechter indicate, in wave 3 of A or C within them.[7] A continuation gap is the same event but within a powerful impulse wave whose center marks the middle of the third wave at multiple degrees of trend, thus explaining Edwards and Magee's comment, "The runaway gap... occurs in the course of rapid, straight-line advances or declines." (p.198) From the standpoint of WP, then, these three types of gaps are all manifestations of the same phenomenon but within different types of waves and different sums of third-wave degrees.

Figure 22. Gaps in the third-wave and third-of-third-wave positions



E&M and WP agree on the position of exhaustion gaps. Edwards and Magee say succinctly, "the exhaustion gap comes at the end." (p.202) Frost and Prechter show in a "real-life example" that a gap sometimes occurs near the peak of the final near-term subdivision of a diagonal-triangle fifth wave, indicating "dramatic reversal ahead." (p.40) (See Figure 23.) The authors' description of a "throw-over," or penetration of the outer line of a trend channel at the very end of an impulse, implies a gap in that position:

Figure 23. Exhaustion Gap



If volume is heavy as the fifth wave approaches its upper trend line, it indicates a possible penetration of the upper line, which Elliott called a "throw-over." Near the point of throw-over, a fourth wave of small degree may trend sideways immediately below the parallel, allowing the fifth then to break it in a final burst of volume. ...A throw-over can also occur, with the same characteristics, in a declining market. (pp.73-74)

Edwards and Magee's depictions of "islands," which are market tops or bottoms with a gap on both sides of a period of price congestion, show that each gap occurs in the third wave of a near term impulse, the first in wave three of 5 of the old trend, and the second in wave three of 1 of the new trend.[8]

We may conclude, then, that observations under E&M regarding gaps are compatible with what WP more specifically describes.

Q. Trend Channel

WP not only agrees with E&M that trend channels occur but also corrects an error that results from E&M's crude application of the idea. A channel under WP attends a specific wave form:

Elliott noted that a parallel trend channel typically marks the upper and lower boundaries of an impulse wave. Connect the ends of waves two and four. If waves one and three are normal, the upper parallel most accurately forecasts the end of wave five when drawn touching the peak of wave three. (Frost & Prechter, pp.71-73)

A key observation here is that a channel often delineates specifically an impulse wave, which is a five-wave sequence, or a zigzag, which is a three-wave sequence, each following certain rules, as described in the text. (Frost & Prechter, pp.31-36; 42-43) E&M proposes channels regardless of wave patterns. Figure 24a shows Elliott's depiction of an impulse that forms within a channel. Both WP and E&M recognize the channel that contains the 1932-1937 bull market in the Dow, as shown in Figure 24b, from Elliott's Financial World articles of 1939. (p.166)[9] But E&M asserts channels at times when relying on them as providing price boundaries would prove harmful. Figure 24c, from Edwards and Magee, depicts a channel from which prices eventually collapsed. WP does not recognize a channel in this situation because these prices negated the zigzag pattern in late August and do not trace out a completed impulse. As Frost and Prechter explained, "In an impulse, wave 4 does not enter the price territory of (i.e., 'overlap') wave 1." (p.31) The proper Elliott wave labeling is added to Edwards and Magee's chart to show that no impulse was ending at any time during this price record. The presumed support line of that improper channel rather dramatically, and without warning under E&M, gave way. Once again, WP not only subsumes the observation from E&M but does so more accurately and exclusively.

Figure 24a. An Elliott wave channel

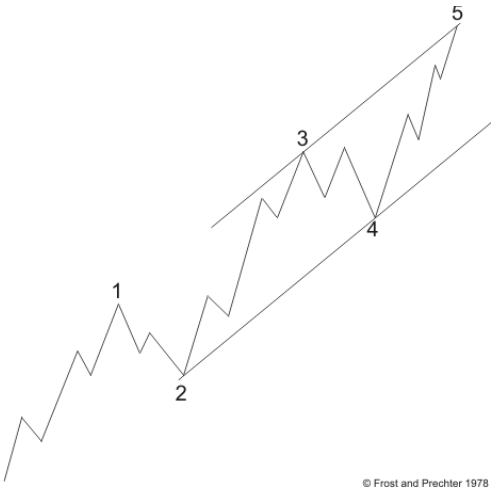


Figure 24b. A real-life channel

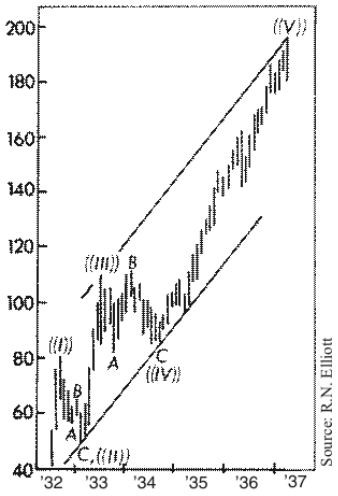
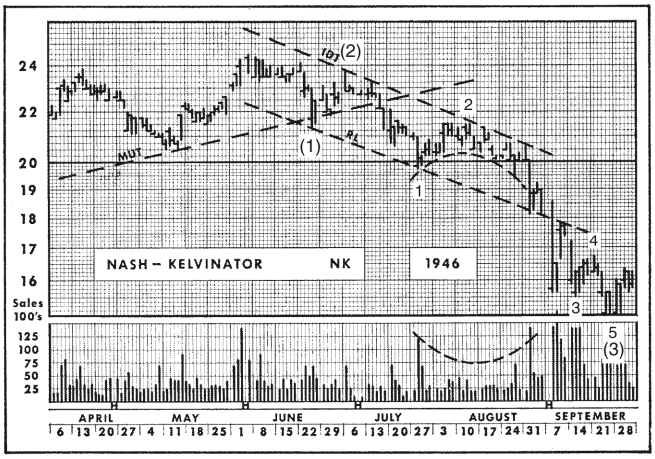


Figure 24c. A spurious channel, with proper wave labels



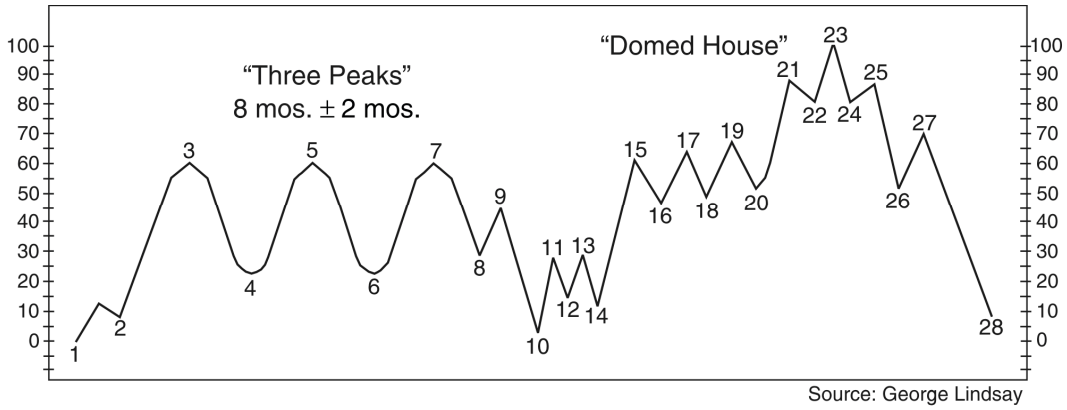
R. Three Peaks and a Domed House

In 1968, technical analyst George Lindsay, during the time that he published a stock-market newsletter from 1951 to 1975, postulated a pattern he called "three peaks and a domed house," which is illustrated in Figure 25a.[10] The pattern has proved useful enough that some technicians have continued to apply it. The pattern comprises a series of 10 points in a "sideways" trend, 13 points in an uptrend and then 5 points that bring prices to or below point #10.

Lindsay asserted that the "3 peaks" portion should last 6 to 10 months and the "domed house" portion 7 1/3 months, although some chartists today focus on the shape of the pattern regardless of the time element. Either way, WP easily subsumes Lindsay's observation. Others have seen the connection; for example, analyst Barry Ritholtz (2003) comments as follows:

Lindsay's three peaks and a domed house looks like a 4th wave triangle and a 5-wave impulse in Elliott wave analysis. A triangle for the 4th wave is usually the last correction in an advance, and the 5 waves up from the 4th wave low is, then, a peak of the advance.

Figure 25a. Idealized George Lindsay "Three Peaks and a Domed House" formation



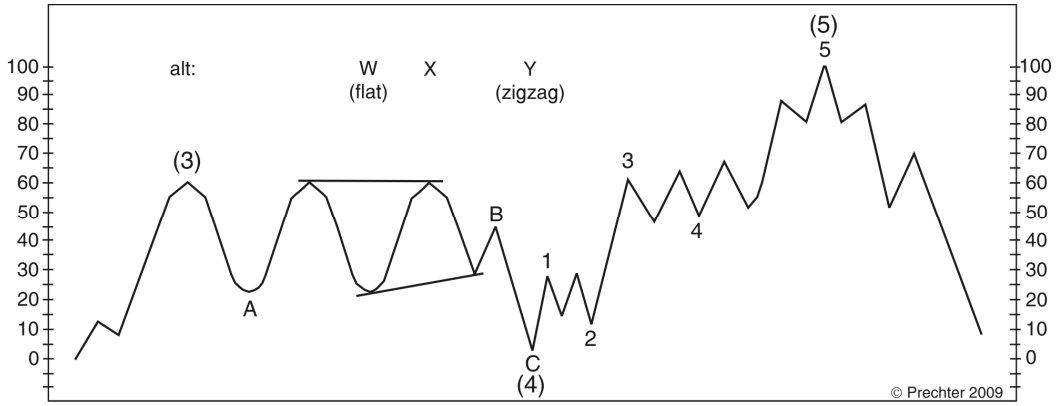
Barclay Leib (2000) made compatible comments in this regard:

After a sharp reverse from the point 10 low, first there is a small requisite double test of that low. This transpires during the period labeled points 12 and 14 (which in traditional Elliott wave analysis terms would typically be labeled wave ii of 5). After point 14, the market shoots higher into point 15. Lindsay labeled this advance the "Wall of the First Story." Elliott would undoubtedly have called it a wave iii of 5. The "Roof of

the First Story" follows, and typically takes the form of a flat or expanding zigzag with at least 5 reversals (down into point 16, up to 17, down to 18, up to 19, and down to 20). After the fifth reversal is achieved at point 20, the main uptrend is resumed into what Lindsay referred to as the "Wall of the Second Story." In Elliott terms, the diagonal triangle[11] would of course be labeled a iv of wave 5, and the "Wall of the Second Story" would be the beginning of the final v of 5 advance.

Figure 25b labels waves closely reflecting Ritholtz's and Leib's prose. The message from "Three Peaks and a Domed House" and that from WP are identical at each stage.

Figure 25b. Elliott waves fit the pattern



Source: George Lindsay

III. Which is a Better Description of Market Behavior?

S. Other Chart Patterns

There are other purported patterns of market behavior, with names such as "catapult," "cup-and-handle" and "inverted bat-wing formation." One has to stop somewhere. This review illustrates that traditional, seasoned chart formations fall within the structure of WP.

In most cases described above, patterns under WP are more specifically delineated than those of E&M, so the descriptions are rarely identical. For example, a triangle under E&M is any sideways price action between two converging lines, and a wedge is any progressing price action between two converging lines. Under WP, each of these forms must comprise five waves, no more and no less. Similarly, a trend channel under E&M can encompass any price action, while a trend channel under WP is valid only if it derives from a line touching the ending points of waves two and four of an impulse or the starting points of waves A and C in a zigzag. Regarding the difference between these two sets of description, Frost and Prechter expressed this opinion in *Elliott Wave Principle*:

Despite this compatibility, after years of working with the Wave Principle we find that applying classical technical analysis to stock market averages gives us the feeling that we are restricting ourselves to the use of stone tools in an age of modern technology. (p.195)

This difference leads to a question, namely, which analytical description is more accurate? Do triangles, wedges and channels occur in all kinds of places (per E&M) or only specific ones (per WP)? Either E&M's patterns subsume some of WP's forms, and WP is incorrect in its relative specificity, or WP subsumes E&M's forms, and E&M is incorrect in its relative generality.

Three observations appear to tilt the balance in favor of WP's descriptive primacy. First, WP is a more thorough description of market behavior than are chart patterns. E&M describes a few forms, while WP attempts to account for all market movement. Such a description is more likely to subsume E&M's forms

than vice versa. This fact leads to another question, which is whether WP's more encompassing description is valid. Perhaps, one might venture, E&M's patterns are all that exist, and WP's greater scope is an invalid macro construct. A second observation answers this question to the extent possible. A study of 70 years of Elliotticians' predictions (Prechter, 2004-2005) supports the validity of WP by showing that its practitioners have produced a significant level of predictive success. We are aware of no similar study relating to the success of E&M application. Finally, Elliotticians provide evidence that E&M's less precise approach can lead to prediction errors that analysis under WP would avoid, per the preceding discussion under "Trend Channel." Therefore, until a better conclusion comes along, it appears that the best way to summarize the difference is to say that R.N. Elliott, Edwards and Magee and the Dow Theorists all recognize real patterns, but Elliott was more meticulous in his observation of them and more encompassing in describing the structural contexts in which each pattern appears. Thus, WP more properly subsumes chart patterns, not vice versa.

IV. Chart Patterns Attending Special Plotting Methods

There are various rules for interpreting "point and figure" plots, an approach to charting that uses no time axis, and "candlestick" plots, which incorporate trading volume in each expression of a market's daily price range. As plotting methods depart from those used to express only price in a temporal context, the task of relating purported patterns to WP becomes more complex and perhaps impossible. Nevertheless, as for candlestick charting, Steve Nison (2001) discusses "Candlesticks with Elliott Wave," and a chapter in Stephen Bigalow's (2002) book is titled, "Using Candlesticks to Improve Elliott Wave Analysis," so apparently this method of charting is compatible with WP. It is even possible, as one of these authors claims, that studying candlesticks could enhance our knowledge of WP, as might empirics from any new perspective. The research underlying WP is incomplete and may turn out to be only part of what remains to be discovered.

V. The Tautological Question

One might ask whether WP is so encompassing that it subsumes every possible chart pattern, thus making the conclusion in this study a tautology, i.e. WP subsumes all patterns because it is all patterns. The discussion in Elliott Wave Principle under the heading "Erroneous Concepts and Patterns" shows why it is necessary to discard one of R.N. Elliott's own claims to a pattern he called an "A-B base." Frost and Prechter explain, "In fact it cannot exist," because "such a pattern, if it existed, would have the effect of invalidating the Wave Principle." (p.60) In other words, WP has a special integrity and is not an infinite catalog of forms. The authors further explain why Elliott's description of a "half moon" is an epiphenomenon, like many chartists' patterns, and why his observations regarding "irregular tops," "irregular type 2 corrections" and "double retracements" are "erroneous concepts." They conclude as follows in their first chapter: "Under the Wave Principle, no other formations than those listed here will occur." (p.60) So, WP is clearly restrictive in its descriptions while being inclusive of chartists' valid patterns as described herein.

VI. Cycles

Numerous books assert that stock prices reveal or react to cycles of fixed periodicities. These ideas include fixed-time cycles, seasonal patterns, the "Decennial Pattern," the presidential cycle, astro-economics and all other assertions that markets adhere to patterns based upon regular time periodicity. WP does not (currently) recognize any cyclic patterns. Therefore, what appear to be cycles are either (1) epiphenomena of WP, (2) the result of undiscovered aspects of WP, (3) the result of forces additional to WP or (4) the result of forces causal to WP as well. No one has done the research to make this determination.[12]

Conclusions

This review supports, for the time being, the following conclusions:

(1) WP subsumes all valid tenets of Dow Theory.

(2) WP subsumes and more specifically defines all valid chart patterns under E&M and Dow Theory.

(3) WP's five essential forms provide all the variation necessary to account for patterns identified under these other disciplines.

(4) The only pattern approach to market analysis that WP does not subsume (at least at the current time) is cyclic analysis.

References

Bigalow, Stephen, 2002, Profitable Candlestick Trading (John Wiley & Sons, New York, NY).

Edwards, Robert D. and John Magee, 1948, Technical Analysis of Stock Trends. 5th Ed. 1966. (John Magee, Springfield, MA)

Elliott, Ralph N., 1938, The Wave Principle, in Robert R. Prechter Jr., ed.: R.N. Elliott's Masterworks – The Definitive Collection. 2nd Ed. 2005. (New Classics Library, Gainesville, GA).

Elliott, Ralph N., 1939. The Financial World articles, in Robert R. Prechter Jr., ed.: R.N. Elliott's Masterworks – The Definitive Collection. 2nd Ed. 2005. (New Classics Library, Gainesville, GA).

Frost, Alfred J., and Robert R. Prechter Jr., 1978, Elliott Wave Principle – Key to Market Behavior. 10th Ed. 2005. (New Classics Library, Gainesville, GA).

Hamilton, William Peter, 1922, The Stock Market Barometer: A Study of Its Forecast Value Based on Charles H. Dow's Theory of Price Movement, With an Analysis of the Market and Its History Since 1897 (Harper & Brothers, New York).

Leib, Barclay T., 2000, Three peaks and a domed house – revisited, Sand Spring Advisors. <http://www.sandspring.com/articles/tp.html>

Lo, Andrew W., Harry Mamaysky, and Jiang Wang, 2000, Foundations of technical analysis: Computational algorithms, statistical inferences, and empirical implementation, *Journal of Finance*, 55, 4, 1705-1765.

Loasby, Brian J., 2000, How do we know?, in Peter E. Earl, ed.: Economics as an Art of Thought: Essays in Memory of G.L.S. Shackle (Routledge, Florence, KY).

Nison, Steve, 2001, Japanese Candlestick Charting Techniques. 2nd Ed. (Prentice Hall, Paramus, NJ).

Ritholtz, Barry, L., 2003, Three peaks and a domed house?, The Big Picture. <http://bigpicture.typepad.com/comments/2003/10/3_peaks_and_dom.html>

Rhea, Robert, 1932, The Dow Theory (Barron's Press, New York, NY).

Prechter, Jr., Robert R., 1999, The Wave Principle of Human Social Behavior and the New Science of Socionomics (New Classics Library, Gainesville, GA).

Prechter, Jr., Robert R., 2003, Pioneering Studies in Socionomics (New Classics Library, Gainesville, GA).

Prechter, Jr., Robert R., 2004-2005, A track record of WP application to the stock market, *The Elliott Wave Theorist*, December 2004 and January 2005 issues.

Prechter, Jr., Robert R., and Deepak Goel, 2009, Not fooled by non-randomness – Among thirteen models, only the Wave Principle model exhibits BDS and KT statistical properties similar to those of the stock market (working paper).

Notes

[1] There are two important tenets of Dow Theory that do not pertain to market patterns per se but do pertain to theory attending WP's patterns. WP and socionomics challenge both of these assertions, namely: (1) "The averages discount everything [and] afford a composite index of all the hopes, disappointments, and knowledge of everyone who knows anything of financial matters, and for that reason the effects of coming events (excluding acts of God) are always properly anticipated in their movement." (Rhea, p.12) and (2) "Manipulation is possible in the day to day movement of the averages, and the secondary reactions are subject to such an influence to a more limited degree, but the primary trend can never be manipulated." (Rhea, p.16) The reader will find a thorough discussion and refutation of the first idea in pages 379-384 of *Pioneering Studies in Socionomics* (2003) and a challenge to the idea of any consequential manipulation of the averages in pages 365-370 of *The Wave Principle of Human Social Behavior* (1999).

[2] The Dow Theory's explanation for the cause of the middle phase of a bull or bear market is fundamentally different from the Wave Principle's. Socionomics, a theory developed around the Wave Principle, postulates that stock averages never *"respond"* to changes in corporate earnings. Rather, they reflect the fluctuations in social mood that *motivate* those very changes.

[3] Generally speaking, curved lines in the stock market are in the eye of the beholder. Straight lines appear naturally when delineating waves.

[4] Elliott used the same term a decade before Edwards and Magee's book was published, but the term may have been in use prior to that time.

[5] To keep these illustrations simple for non-Elliotticians, the wave labels in Figure 12d reflect a simplistic analysis of a pattern that in fact is probably in the early stages of a long advance, beginning with a sequence of first and second waves of increasingly smaller degree.

[6] See Frost and Prechter, p.164, Figure 5-5 for another real-life example.

[7] For examples, see the gaps in the month of May in Figure 122 of Edwards and Magee, p.193.

[8] For an example, see Edwards and Magee, Figure 133 on p.208.

[9] See Edwards and Magee's version in Figure 179 on p.268.

[10] Investors Intelligence (New Rochelle, NY) offers several of George Lindsay's essays.

[11] He means triangle, not diagonal triangle.

[12] While open to competing theories, *The Elliott Wave Theorist* (July 16, 2004) offered this view: "Cycles are not waves; they are probably transient epiphenomena of the Wave Principle." Prechter has also commented that the occasional appearance of cycles within the Elliott wave structure of the stock market may be analogous to the perfect ellipses and circles that sometimes appear in plots of fractals such as the Mandelbrot set.

About the Author

Author: Robert R. Prechter Jr., CMT
President, Elliott Wave International
Executive Director, Socionomics Institute
Founder, Socionomics Foundation

Robert R. Prechter Jr. first learned of R.N. Elliott's Wave Principle in the late 1960s. In 1978, Prechter and A.J. Frost co-authored Elliott Wave Principle—Key to Market Behavior. In 1979, he started The Elliott Wave Theorist, a publication devoted to analysis of the U.S. financial markets, which he continues to edit today. In 1990-1991, Prechter served as president of the Market Technicians Association in its 21st year. The Wave Principle of Human Social Behavior and the New Science of Socionomics, published in 1999, expands upon a thesis of social causality that Prechter first proposed in 1979.

Using IPOs to Identify Sector Opportunities

Kevin Lapham, CMT

4

Abstract

The number of initial public offerings (IPOs) is a well-known, long-term stock market indicator. With the popularity of sector investing and the increased use of exchange traded funds, it would be advantageous to employ a new IPO-based indicator to assess sector health, improving upon available technical market measures. This study will examine how the number of IPOs within the ten market sectors can be used to help identify overbought or oversold conditions in each respective sector.

Introduction

The number of initial public offerings (IPOs) is a well-known, long-term indicator that can help confirm peaks and troughs in the stock market. Previous studies documented by Timothy Hayes (2001) have explored the relationship between an increase or decrease in the number of initial public offerings and the corresponding peak or valley in the broad market that often follows.[1] However, there is a lack of available information about the use of IPOs to perform sector analysis. Demonstrating the value of using a narrower perspective, this study will winnow the number of IPOs down to the sector level to provide a new market metric.

The theory behind the success of this indicator is twofold. First, investor sentiment can be gauged by the number of IPOs brought to market. Companies, venture capitalists, and investment banks will not benefit from the issuance of new shares unless there is ample investor interest in such an offering. In studies by Norman G. Fosback (1985), he stated "Companies sell stock to the public primarily when they need capital for expansion and related purposes. This usually occurs when business prospects are bright and companies view their stocks as generously priced by the market."[2] This can only happen effectively when investor sentiment is bullish and stock prices have been rising. In a 2006 Bloomberg news story, it was reported "Chief executive officers are turning to stock markets for financing now that the Standard & Poor's 500 Index is near a four-year high." [3]

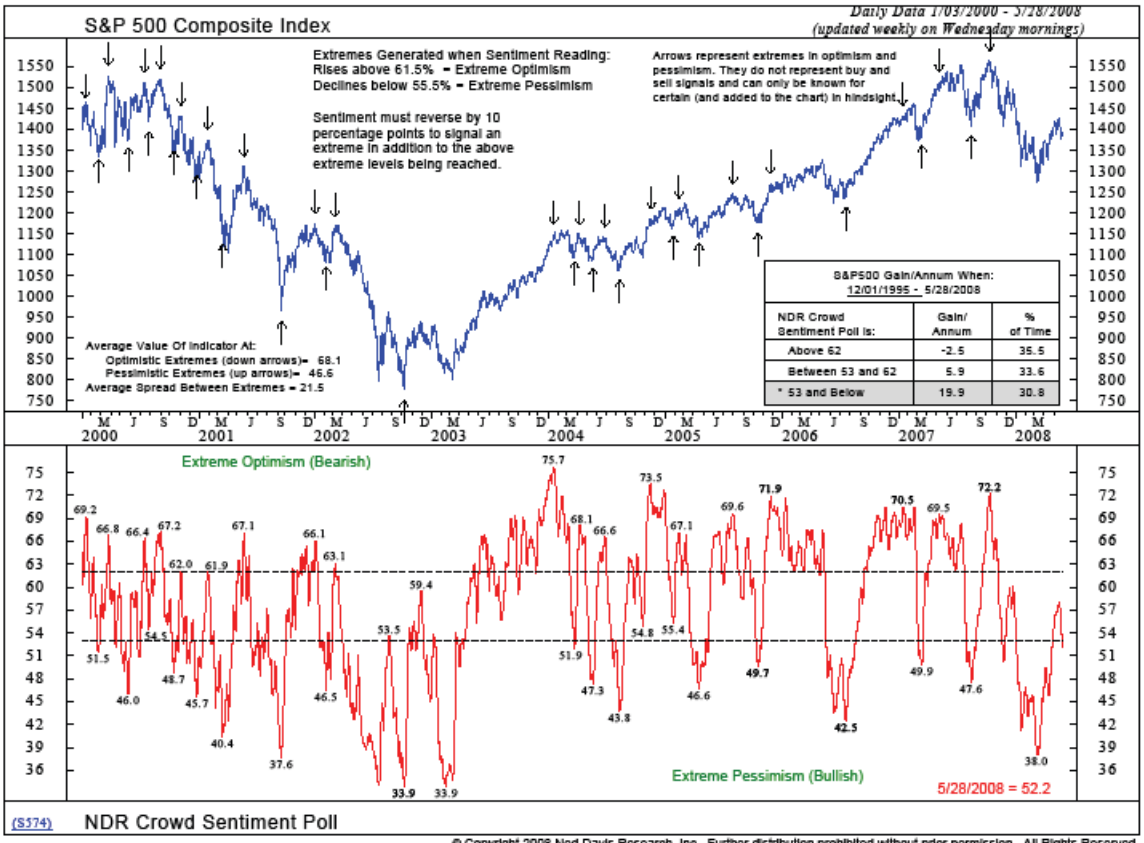
Second, the number of IPOs provides a measure of supply and demand. Norman G. Fosback (1985) also stated, "The new source of supply introduced into the market's supply-demand equation also has the effect of diverting investment funds away from other stocks, thus exerting downward pressure on prices." [4]

Since stocks in a sector typically move in concert with one another, a number of IPOs within the same sector that begin to falter due to lack of buying interest and excess supply will weigh on all stocks in that sector. This study will examine how the use of the number of IPOs within a sector can be successfully applied to help identify overbought or oversold conditions in each respective sector.

I. Investor Sentiment

A variety of methods can be used to measure investor sentiment for the broad market, such as: Marketvane[5], The American Association of Individual Investors[6], Daily Sentiment Index[7], Consensus, Inc.[8], and the Ned Davis Research Crowd Sentiment Poll[9] (a composite that includes these aforementioned and other sentiment indicators - **Figure 1.1**). While each provides useful predictions of overbought and oversold levels for the broad market, none of these sentiment indicators provide sentiment readings for a specific market sector.

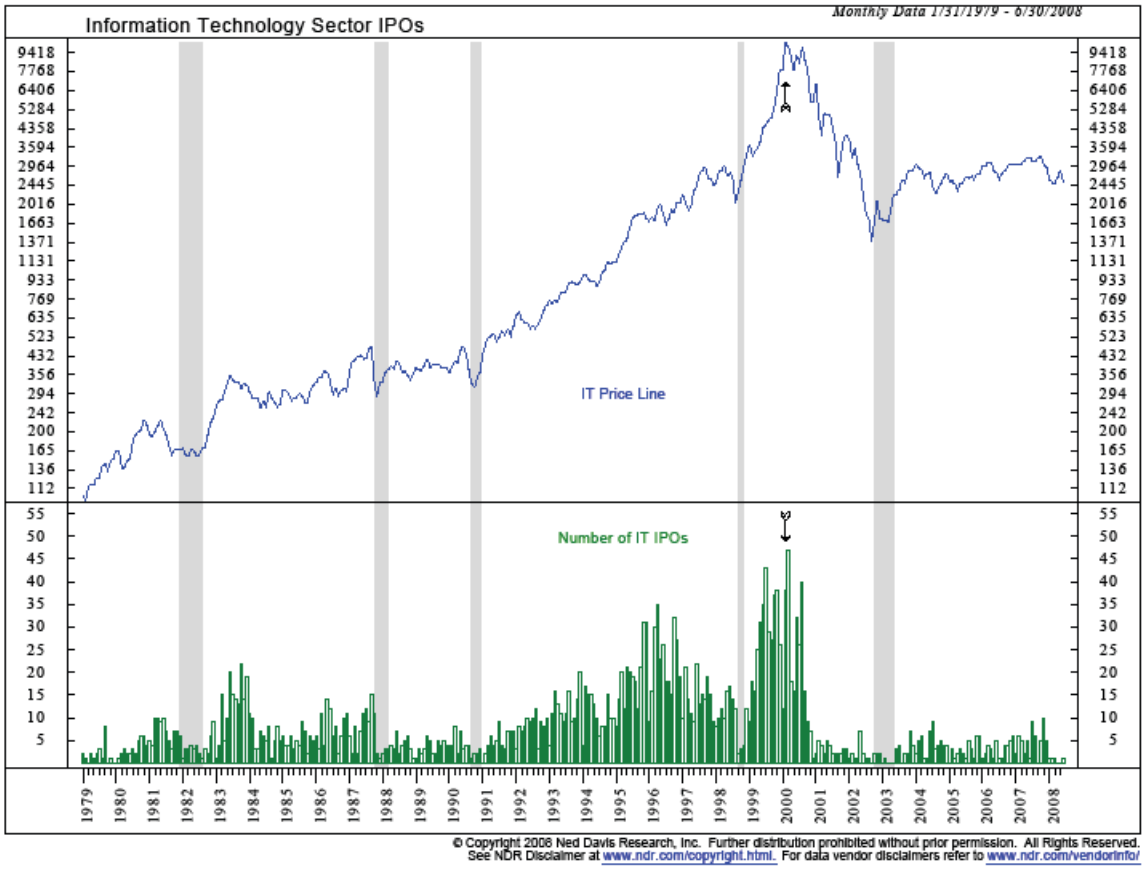
Figure 1.1 NDR Crowd Sentiment Poll, Courtesy of Ned Davis Research


S&P 500 Composite Index
Daily Data 1/03/2000 - 5/28/2008
(updated weekly on Wednesday mornings)
Extremes Generated when Sentiment Reading:
Rises above 61.5% = Extreme Optimism
Declines below 55.5% = Extreme Pessimism
Sentiment must reverse by 10 percentage points to signal an extreme in addition to the above extreme levels being reached.
Arrows represent extremes in optimism and pessimism. They do not represent buy and sell signals and can only be known for certain (and added to the chart) in hindsight.
Average Value Of Indicator At:
Optimistic Extremes (down arrows)= 68.1
Pessimistic Extremes (up arrows)= 46.6
Average Spread Between Extremes = 21.5
S&P500 Gain/Annum When:
12/01/1995 - 5/28/2008
NDR Crowd Sentiment Poll is:
Gain/ Annum
% of Time
Above 62
-2.5
35.5
Between 53 and 62
5.9
33.6
* 53 and Below
19.9
30.8
2000
2001
2002
2003
2004
2005
2006
2007
2008
Extreme Optimism (Bearish)
Extreme Pessimism (Bullish)
5/28/2008 = 52.2
($574)
NDR Crowd Sentiment Poll
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/

Utilizing IPOs from a sector perspective fills in this missing link. As a market advances at a healthy pace, investors will feel comfortable buying up shares of IPOs, especially in hot sectors. During times of high investor interest, prices may be driven to unsustainable levels. Markets will do their best to take advantage of the escalating demand. A peak in prices may be looming on the horizon when buying interest exhausts, crowd opinion reaches an extreme, and the focus increasingly turns to profit-taking. As quoted from Ned Davis (2003) "The speculative trader historically has tended to be more influenced by sentiment and is most often on the wrong side of the market at extremes."[10] As a result, investor sentiment can be gauged by measuring the number of IPOs by sector on a monthly basis. The IPO by Sector Indicator is a contrarian indicator; hence, high volumes of offerings in the same sector are bearish for that respective sector, while low levels of offerings often coincide with buying points.

A clear example of investor exuberance related to a specific market sector is that associated with the Year 2000 tech bubble (**Figure 1.2**). In 1999, this sector outperformed all others with record momentum and an astounding 140% annual return. An emerging internet/tech industry could not have existed without the huge investor appetite for shares of new issues. This unrestrained enthusiasm drove prices to unforeseen levels, resulting in one of the worst bubbles in decades. The lower clip in **Figure 1.2** illustrates the spike in the number of technology IPOs per month in February 2000 (indicated by a down arrow). The solid line in the upper chart clip represents the NASDAQ-100 Index bubble top (indicated by an up arrow). This is an unmistakable example of an increase in the number of IPOs correctly forecasting a bearish outcome which was realized after the year 2000. There were also successful sell signals during the early 1980's. However, during the mid-1990's, there was a peak in the number of IPOs, but no distinct tech sector pull-back. A plausible reason for this may be due to the secular bull market of that time where ample investor demand was gobbling-up all the new supply. This is an important caveat the analyst must take into account while using this

Figure 1.2 Relationship between Tech sector IPOs and NASDAQ-100 Index


Information Technology Sector IPOs
Monthly Data 1/31/1979 - 6/30/2008
IT Price Line
Number of IT IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/

indicator. Use of IPO relative strength may be used to help sort out early sell signals due to heavy demand (see part **IV. Applications**).

Also illustrated in 1982, 1987, 1991, 1998, and 2002 are a very low number of IPOs compared to surrounding activity (shaded areas in **Figure 1.2**). These periods coincided with good buying opportunities.

II. The IPO Study

A. Sector IPO Data Compilation

For the purposes of this study, Initial Public Offerings (IPOs) are defined as a new issue of an equity listed on a major U.S. exchange. Only IPOs for the major exchanges have been included in this study:

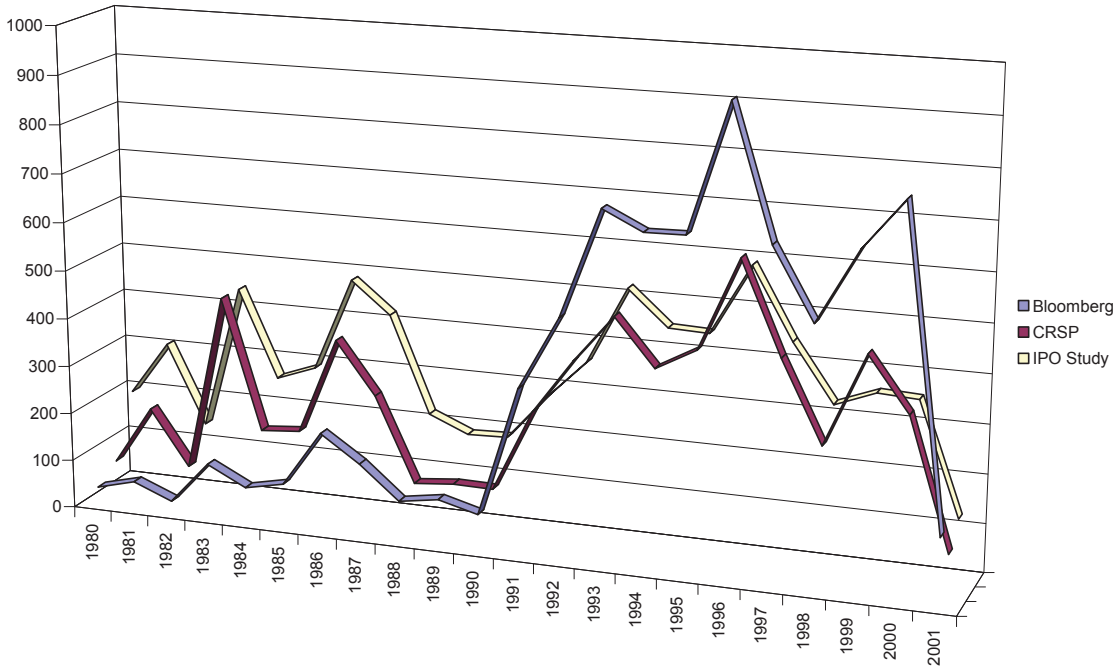
- New York Stock Exchange
- American Stock Exchange
- NASDAQ

IPOs do not include: bonds, mutual funds, unit trusts, exchange-traded funds, or other hybrid securities. New listings as a result of a spin-off, stock dividend, or other corporate action have also been excluded. New listings of foreign companies on a major U.S. exchange, as well as American Depositary Receipts (ADRs), are included if the underlying foreign company is indeed issuing new stock for the first time.

The IPO totals were computed monthly. The date the issue begins trading on a major exchange is the inclusion month of the issue. Upon adding the new issue into the monthly totals, a determination was made whether the issue had a corresponding Standard & Poor's[11] GICS (Global Industry Classification Standard) code. If a GICS code was not available, each new issue was researched and a determination was made as to the appropriate sector placement.

One of the major hurdles in this study was the lack of available IPO data by sector in a uniform and useable format. Some vendors offering IPO data misclassified events which made it necessary to create a completely independent historical IPO database. The number of IPOs per month compiled for this study was found to generally have an 80+% correlation level to other sources such as CRSP (Center for Research in Security Prices) and Bloomberg as illustrated in **Figure 2.1**.

Figure 2.1 Correlation of number of IPOs by year



Data differences can be attributed to several types of errors common amongst the vendors: misclassifying IPOs events, timing differences (using IPO announce date vs. IPO trade date), and tally errors. This study only uses the date when the new issue was listed and began trading which provides emphasis as to when IPOs may truly affect supply in a sector.

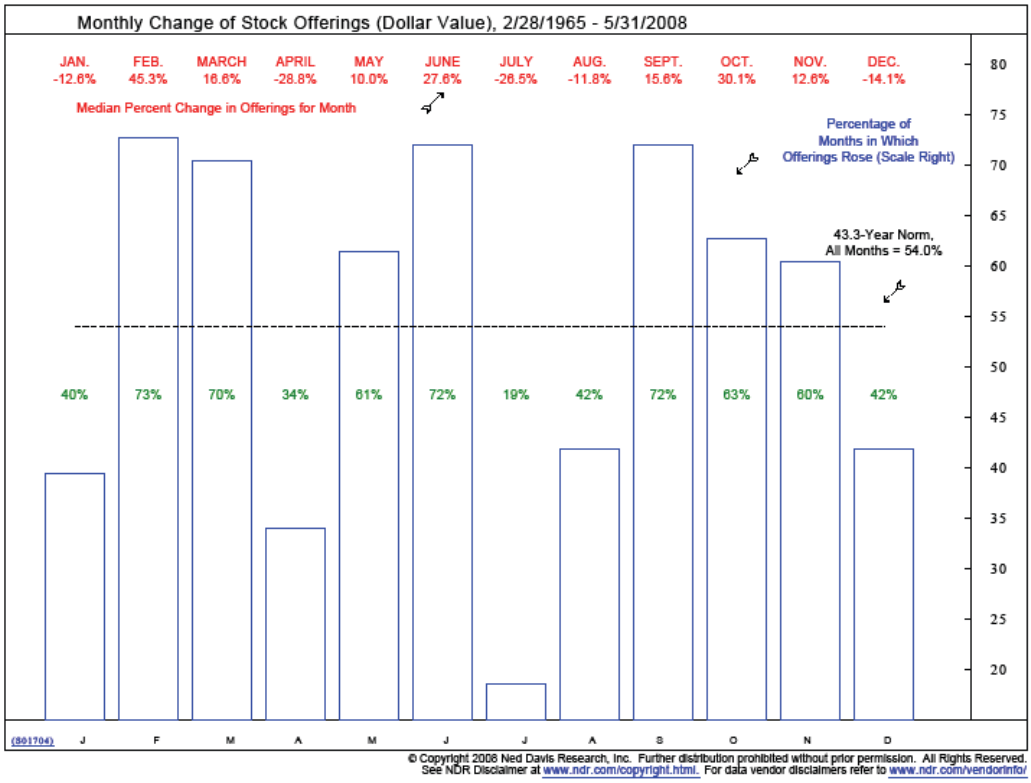
B. IPO Sector Study Parameters and Methodology

IPOs are seasonally strong in February, March, June, and September and weak in January, April, July, and December. (illustrated in **Figure 2.2**).

Due to this cyclic nature of IPOs[12], deviation from trend was determined to be the most appropriate means to identify overbought and oversold areas. Deviation from trend is calculated by dividing a short-term moving average of the total number of sector IPOs per month by a longer moving average of the total number of sector IPOs per month and plotting the ratio of the two.[13] In this study, a 3/12-Month deviation from trend was applied to each of the IPO counts from the 10 sectors. These parameters were employed to normalize the IPO data for the aforementioned seasonal cycle (historically, IPOs have generally tended to experience a trough every third month). As the deviation from trend passed below a bracket (i.e. buy zone line), a buy signal was generated and when passing above a bracket (i.e. sell zone line), a sell signal was generated. The next signal was not generated until there was a crossover of the opposite bracket. Consecutive signals on the same end of a bracket were ignored.

Several variations in bracket parameters and deviation from trend were tested and have been included in the study analysis section. Through programmatic testing and optimization, upper and lower brackets were refined to affect the buy and sell signals. See **Appendix A** for the charts illustrating these optimized signals.

Figure 2.2 Stock Offering Seasonality, Courtesy of Ned Davis Research


Monthly Change of Stock Offerings (Dollar Value), 2/28/1965 - 5/31/2008
JAN. -12.6%
FEB. 45.3%
MARCH 16.6%
APRIL -28.8%
MAY 10.0%
JUNE 27.6%
JULY -26.5%
AUG. -11.8%
SEPT. 15.6%
OCT. 30.1%
NOV. 12.6%
DEC. -14.1%
Median Percent Change in Offerings for Month
Percentage of Months in Which Offerings Rose (Scale Right)
43.3-Year Norm, All Months = 54.0%
40% 73% 70% 34% 61% 72% 19% 42% 72% 63% 60% 42%
80 75 70 65 60 55 50 45 40 35 30 25 20
(801704) J F M A M J J A S O N D
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/

An example of bracket parameter analysis results can be found in **Appendix C**. The IPO by Sector Indicator performed well using varying deviation from trend and bracket parameters, exemplifying the robustness of this indicator.

III. Study Analysis

The IPO by Sector Indicator resulted in an average excess return of 23.4% per annum in mode basis. Mode basis gauges the effectiveness of the IPO model based on the degree of bullishness or bearishness as determined by the deviation from trend signals. The tables appearing on each of the charts noting "Gain/Annum When" (see **Appendix A**) show three perspectives on how the sector's returns have historically performed with the model's bullish, bearish, or neutral readings (the modes). The bullish modes have been summarized in **Table I**.

Table I. Mode basis performance of IPO DT model

Sector	Buy/Hold	IPO % Return*	Excess Return
Energy	10.5	23.9	13.4
Materials	9.4	15.8	6.4
Industrials	11.1	37.7	26.6
Consumer Discr	11.1	25.9	14.8
Consumer Staples	11.2	17.1	5.9
Health Care	14.2	46.1	31.9
Financials	10.8	10.3	-0.5
Information Tech	11.4	23.2	11.8
Telecom Services	8.2	17.8	9.6
Utilities	4.8	16.2	11.4

*when DT is in bullish mode

Tables II-V summarize the gain per annum on a trade signal basis for each of the ten GICS sectors compared to a buy and hold strategy for in-sample, out-of-sample, and the complete history periods.

Tables II-III. Signal basis performance of IPO DT model (in/out sample periods)

In Sample Period, 1/31/1979-1/31/1995, Brackets 50/110, DT 3/12

Sector	# Obs. in mos.	Auto-correlation*	# Trades	% Profitable	Buy/Hold	IPO % Return	Excess Return
Energy	192	0.81	8	88%	3.6	6.5	2.9
Materials	192	0.78	7	71%	11.5	10.4	-1.1
Industrials	192	0.86	4	100%	12.6	45.0	32.4
Consumer Discr	192	0.86	4	100%	16.2	30.0	13.8
Consumer Staples	192	0.74	11	82%	14.9	29.7	14.8
Health Care	192	0.83	6	83%	16.3	41.2	24.9
Financials	192	0.82	7	71%	14.0	29.3	15.3
Information Tech	192	0.80	7	86%	15.9	29.9	14.0
Telecom Services	192	0.70	15	73%	13.3	20.5	7.2
Utilities	192	0.59	20	65%	5.5	7.9	2.4

*Autocorrelation for each table refers to IPO count data series.

Out of Sample Period, 2/1/1995-6/30/2008, Brackets 50/110, DT 3/12

Sector	# Obs. in mos.	Auto-correlation*	# Trades	% Profitable	Buy/Hold	IPO % Return	Excess Return
Energy	160	0.76	7	86%	19.1	33.4	14.3
Materials	160	0.75	10	70%	6.5	10.1	3.6
Industrials	160	0.74	8	88%	9.0	23.6	14.6
Consumer Discr	160	0.83	4	100%	5.0	14.0	9.0
Consumer Staples	160	0.69	12	50%	6.8	-2.4	-9.2
Health Care	160	0.77	8	86%	11.5	16.3	4.8
Financials	160	0.84	4	75%	6.8	9.9	3.1
Information Tech	160	0.84	4	75%	5.8	-0.6	-6.4
Telecom Services	160	0.68	11	82%	2.1	2.3	0.2
Utilities	160	0.64	15	47%	4.0	7.0	3.0

*Autocorrelation for each table refers to IPO count data series.

Table IV. Signal basis performance of IPO DT model (complete history)

Complete History, 1/31/1979-6/30/2008, Brackets 50/110, DT 3/12

Sector	# Obs. in mos.	Auto-correlation*	# Trades	% Profitable	Buy/Hold	IPO % Return	Excess Return
Energy	353	0.79	16	87%	10.5	17.7	7.2
Materials	353	0.77	17	71%	9.4	10.8	1.4
Industrials	353	0.80	12	92%	11.1	32.8	21.6
Consumer Discr	353	0.85	8	100%	11.1	22.2	11.1
Consumer Staples	353	0.72	23	65%	11.2	12.9	1.7
Health Care	353	0.80	13	85%	14.2	27.5	13.3
Financials	353	0.83	11	73%	10.8	21.4	10.6
Information Tech	353	0.82	11	82%	11.4	14.4	3.0
Telecom Services	353	0.70	26	77%	8.2	13.3	5.1
Utilities	353	0.61	35	57%	4.8	7.5	2.6

*Autocorrelation for each table refers to IPO count data series.

Figure 3.1 Performance Comparison

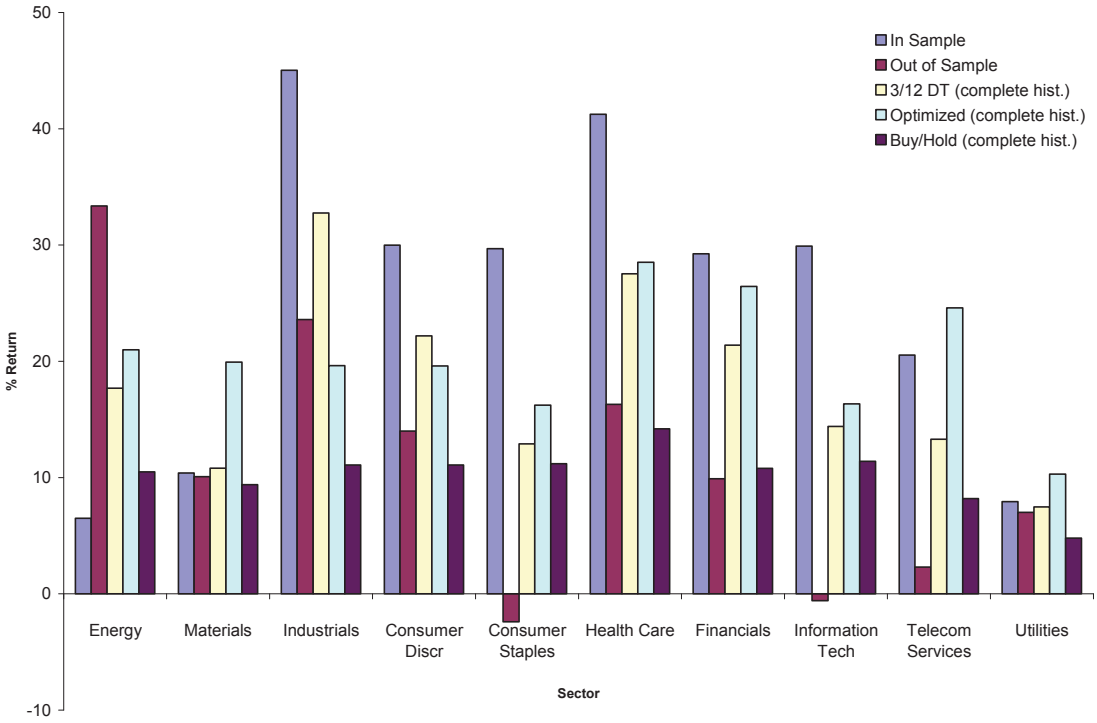


Table V. Signal basis performance of IPO DT model (complete history optimized)

Complete History, 1/31/1979-6/30/2008, Various Brackets & DT (optimized)

Sector	# Obs. in mos.	Auto-correlation*	# Closed Trades	% Profitable	Buy/Hold	IPO % Return	Excess Return	# Open Trades	IPO % Mark Mkt*
Energy	353	0.85	4	100%	10.5	21.0	10.5	0	21.0
Materials	353	0.88	3	100%	9.4	19.9	10.5	1	13.0
Industrials	353	0.62	12	92%	11.1	19.6	8.5	1	16.8
Consumer Discr	353	0.63	17	82%	11.1	19.6	8.5	1	18.1
Consumer Staples	353	0.61	19	68%	11.2	16.2	5.0	1	14.6
Health Care	353	0.63	12	83%	14.2	28.5	14.3	1	27.5
Financials	353	0.47	7	86%	10.8	26.5	15.7	1	21.1
Information Tech	353	0.61	13	77%	11.4	16.3	4.9	1	16.0
Telecom Services	353	0.65	18	83%	8.2	24.6	16.4	1	22.7
Utilities	353	0.75	11	82%	4.8	10.3	5.5	0	10.3

*Autocorrelation for each table refers to IPO count data series.
**IPO % Return including open trades. Open trades were closed by marking to market on 06/30/2008 (end of the study).

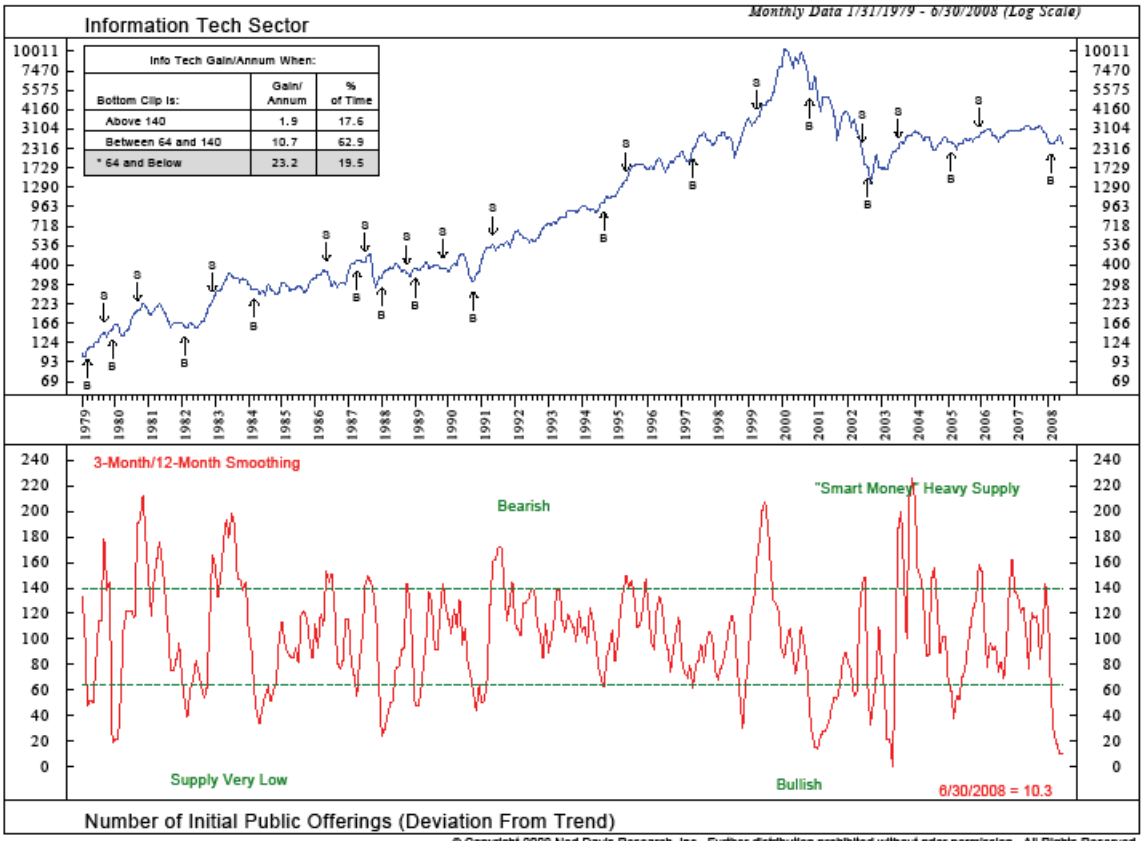
In both the standardized (all sector parameters set with DT 3/12, BR 50/110) and optimized complete history results, all ten sectors beat a buy and hold strategy illustrating the effectiveness of the IPO by Sector Indicator and supporting the underlying sentiment and supply/demand premise. See the performance comparison in **Figure 3.1** and data in **Tables IV & V**. However, underperformance in the standardized out of sample period occurred in two sectors: Consumer Staples and Information Technology. During this period, Information Technology returned a small loss of 0.6% resulting from one bad trade. Although not used in this study, risk management would be an effective means to minimize these types of losses. In Consumer Staples, half of the trades during the period lost due to whipsaws from the trade signals. As is often the case in sector studies,

each sector had unique cycle characteristics with varying success rates using the IPO by Sector Indicator. Consequently, modifying the DT parameters or the brackets (buy/sell levels) would aid in the reduction of these whipsaws. By using a harmonic of the initial 3-month/12-month DT and various bracket parameters, more consistent results could be achieved for Consumer Staples and other sectors (**see Table V**).

Long trades encountered smaller draw downs and better performance than shorts due to the earlier discussed caveat of increasing demand absorbing an increased IPO supply. These periods typically coincided with strong positive price momentum. For example, in the Information Technology sector, the average profit per long trade was 20.4% with 77% of trades profitable. Conversely, the average loss for short trades was 14.3% with only 38% of the trades profitable.

The following chart illustrates the information technology sector signals using a 3-Month/12-Month deviation from trend (**Figure 3.2**). Charts for all sectors can be found in **Appendix A**.

Figure 3.2 Information Technology Sector (GICS 45), 3-Month/12-Month DT



IV. Applications

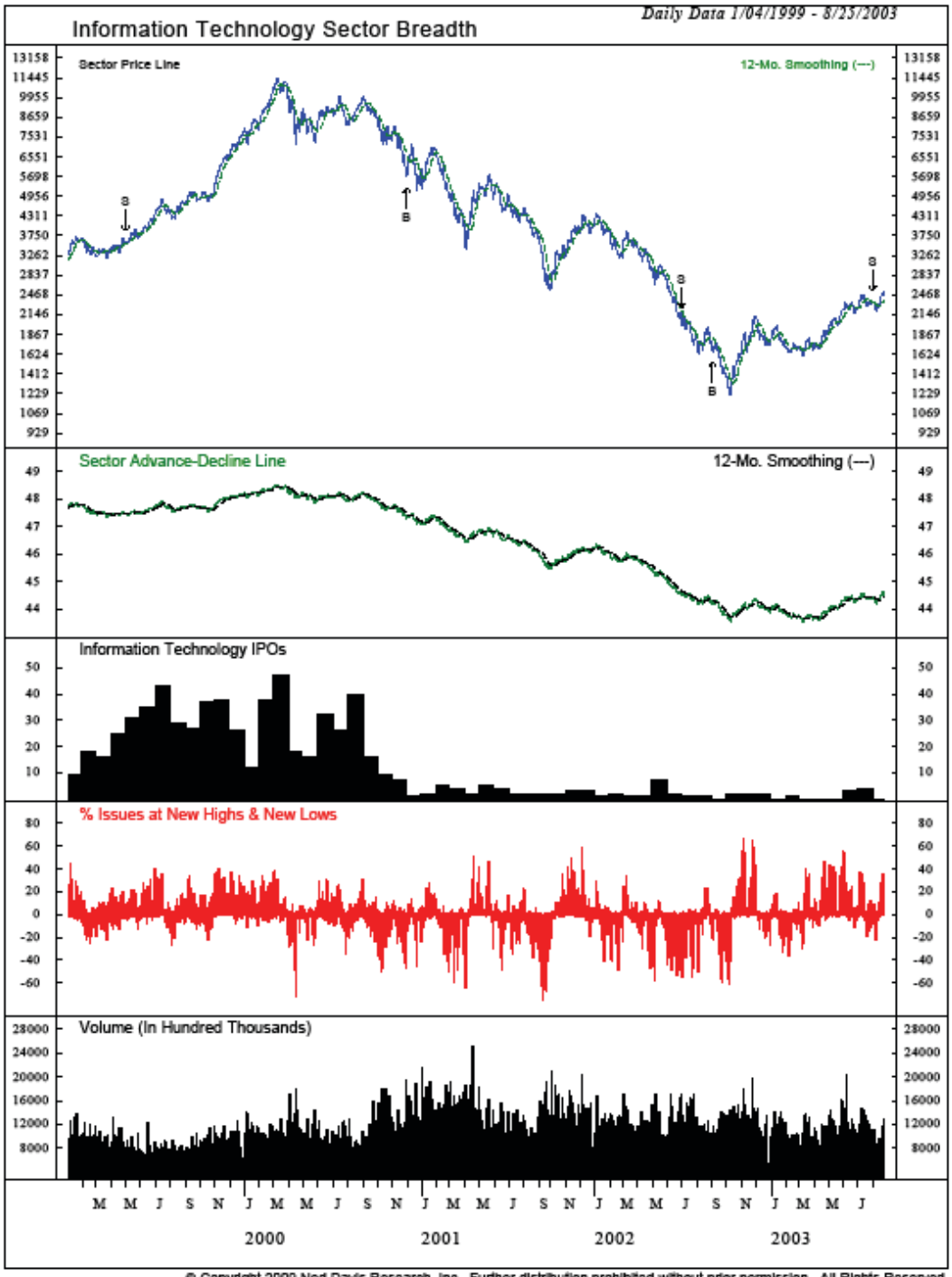
The use of the IPO by Sector Indicator is a tool that may assist the analyst with spotting buying and selling opportunities in the medium and long-term time frame for the ten market sectors. Although satisfactory trading signals have been generated strictly from the underlying IPO data itself, it is always prudent to obtain confirmation from other market indicators. **Figure 4.1** provides an example of a breadth chart for the Information Technology Sector which could be used for this purpose. Analyzing trend and breadth in conjunction with the IPO indicator can provide a picture of the sector's underlying strength or weakness. For example, it may not be necessary to get too bearish on the 4/30/1999 sell signal as the sector advance/decline line had not reversed, the price uptrend remained intact, and the percent of issues at new highs were rising – all

in favor of the bulls. Alternatively, the buy signal on 11/30/2000 was not confirmed by breadth as the advance/decline line was trending downwards on increasing volume, a negative sign.

Additionally, the analyst should consider relative strength. This commonly used means of assessing the strength of a stock to an index can also be applied to IPOs. In this study, the number of sector IPOs is plotted as a percent of the total number of IPOs. IPO Relative strength charts for each sector can be found in **Appendix B**.

The IPO by Sector Indicator can be easily integrated with other technical indicators or be used as a component in other technical and fundamental models.

Figure 4.1 Information Technology Sector Breadth Indicators



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

V. Conclusion

The IPO by Sector Indicator improves on broad market sentiment indicators by providing a more detailed view point of sentiment at the sector level. This study illustrates that as the number of IPOs peaked in a particular sector, so did the risk that a price zenith was near. Moreover, the lack of IPOs in a sector was a strong indicator of an approaching base in that respective sector.

As demonstrated, even a trading model that relies solely on IPO data itself has historically been profitable. Using the IPO indicator in conjunction with other indicators or models can aid the technician in achieving a better perspective of sentiment and/or supply and demand forces that may come to influence the posture of the ten market sectors.

Endnotes

[1] p. 151, *The Research Driven Investor: How to use Information, Data and Analysis for Investment Success*.

[2] p. 103, *Stock Market Logic*, Norman G. Fosback.

[3] Hester, Elizabeth, "Chipotle Kicks Off Busiest Start of IPOs Since 2000", *Bloomberg News*, February 8, 2006

[4] p. 103, *Stock Market Logic*, Norman G. Fosback.

[5] Market Vane Corporation, P .O. Box 90490, Pasadena, CA., 91109

[6] The American Association of Individual Investors, 625 N. Michigan Ave., Chicago, IL 60611

[7] Daily Sentiment Index by Jake Bernstein, www.trade-futures.com

[8] Consensus, Inc., P.O. Box 520526, Independence, MO 64052

[9] Ned Davis Research , 600 Bird Bay Drive W, Venice, FL 34287, www.ndr.com

[10] p. 52, *The Triumph of Contrarian Investing: Crowds, Manias, and Beating the Market by Going Against the Grain*.

[11] Standard & Poor's, 55 Water Street, New York, New York 10041, www.standardandpoors.com

[12] Ned Davis Research , 600 Bird Bay Drive W, Venice, FL 34287, www.ndr.com

[13] p. 393, *Technical Analysis Explained: The Successful Investor's guide to Spotting Investment Trends and Turning Points*.

Figures

Figure 1.1 NDR Crowd Sentiment Poll, Courtesy of Ned Davis Research

Figure 1.2 Relationship between Tech sector IPOs and NASDAQ-100 Index

Figure 2.1 Correlation of number of IPOs by year

Figure 2.2 Stock Offering Seasonality, Courtesy of Ned Davis Research

Figure 3.1 Performance Comparison

Figure 3.2 Information Technology Sector (GICS 45), 3-Month/12-Month DT

Figure 4.1 Information Technology Sector Breadth Indicators

Tables

Table I. Mode basis performance of IPO DT model

Tables II-V. Signal basis performance IPO DT model

References

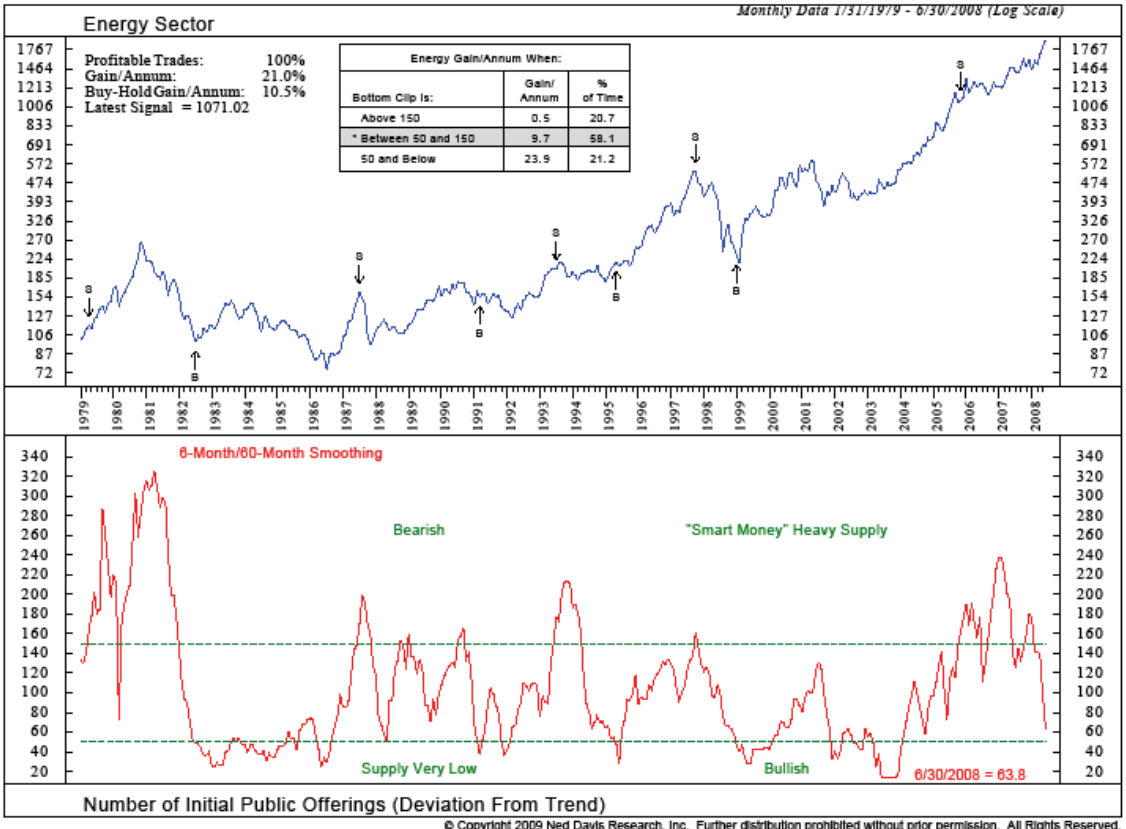
Davis, Ned, 2004, The Triumph of Contrarian Investing: Crowds, Manias, and Beating the Market by Going Against the Grain (McGraw-Hill, New York, NY)

Hayes, Timothy, 2001, The Research Driven Investor: How to use Information, Data and Analysis for Investment Success (McGraw-Hill, New York, NY)

Fosback, Norman G., 1985, Stock Market Logic: A Sophisticated Approach to Profits on Wall Street (The Institute for Econometric Research, Fort Lauderdale, Florida)

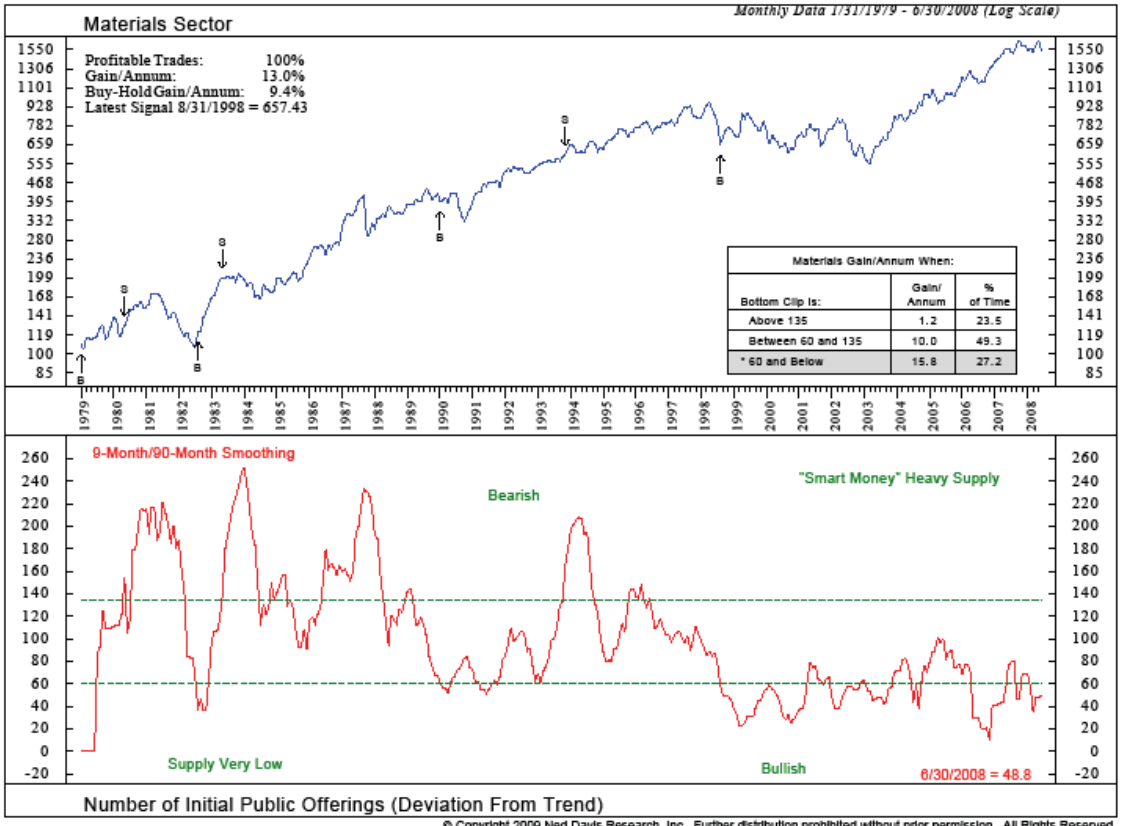
Pring, Martin J., 2002, Technical Analysis Explained: The Successful Investor's guide to Spotting Investment Trends and Turning Points, 4th edition (McGraw-Hill, New York, NY)

Appendix A - Sectore IPO Trade Analysis



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.


```
MARKET SECTOR:  Energy

SIGNAL ANALYSIS
DATES:    1/31/1979 through 6/30/2008  (Monthly)

ACTION    DATE       PRICE   ACTION    DATE       PRICE  PROFIT%  DAYS   $10,000
Long     7/31/1982    98.96  Sell     7/31/1987   159.90   61.59  1826     16,159
Long     3/31/1991   154.09  Sell     7/31/1993   201.51   30.78   853     21,132
Long     5/31/1995   217.32  Sell    10/31/1997   526.30  142.18   884     51,178
Long     1/31/1999   231.85  Sell    11/30/2005  1071.02  361.95  2495    236,417


BATTING AVERAGE

             Total    Number     Profit/   Number    Profit/
            Profit    Trades     Trade      Days      Annum
LONG
    LOSSES     0.00         0       0.00
     GAINS   596.50         4     149.12
     N e t   596.50         4     149.12     6058      20.99


                          RESULTS OF ALL TRADES (Closed + Open)
$10,000 became $236,417 in 6058 days (16.60 years).
21.0% per annum compounded annually.
```



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Materials

SIGNAL ANALYSIS
DATES: 1/31/1979 through 6/30/2008 (Monthly)

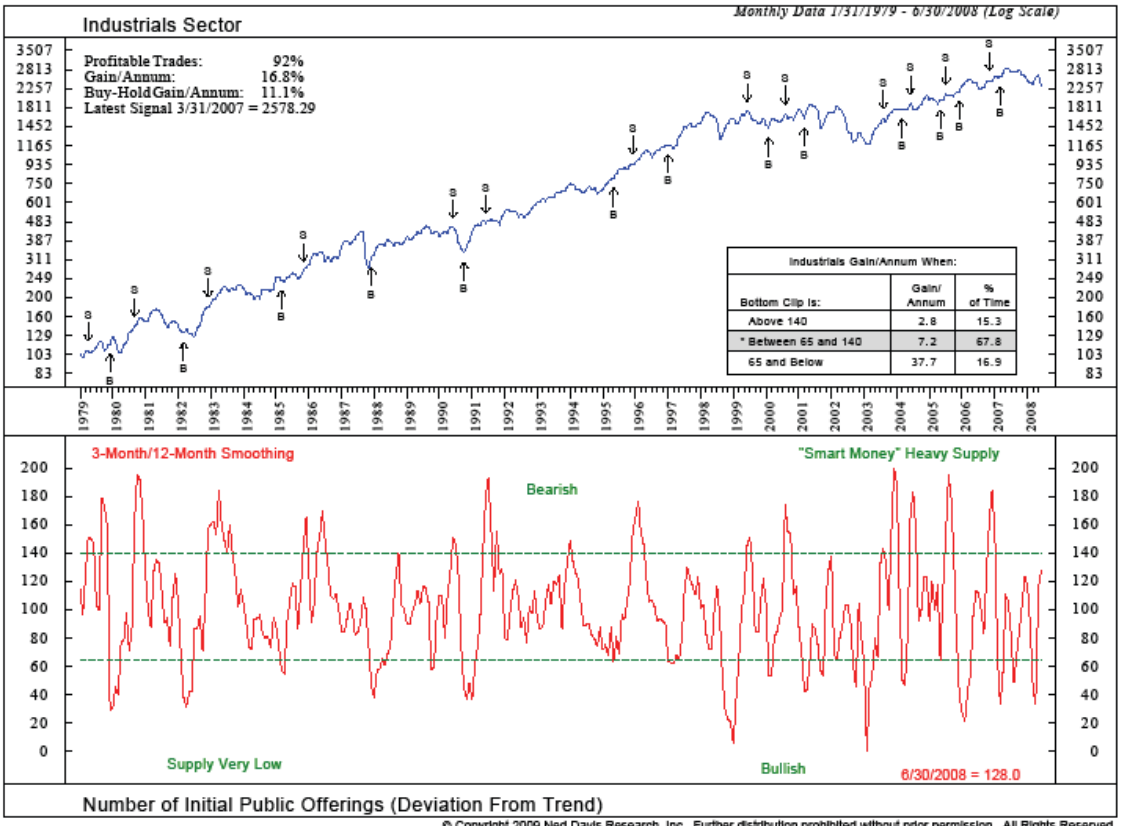
ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	1/31/1979	109.25	Sell	5/31/1980	129.63	18.65	486	11,865
Long	8/31/1982	122.52	Sell	5/31/1983	199.40	62.74	273	19,310
Long	1/31/1990	395.52	Sell	11/30/1993	599.82	51.65	1399	29,284
Long	8/31/1998	657.43	(Open)	6/30/2008	1536.59	133.73	3591	68,445

BATTING AVERAGE

	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	0.00	0	0.00		
GAINS	133.05	3	44.35		
N e t	133.05	3	44.35	2158	19.93

RESULTS OF ALL TRADES (Closed + Open)

$10,000 became $68,445 in 5749 days (15.75 years).
13.0% per annum compounded annually.



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Industrials
SIGNAL ANALYSIS
DATES: 1/31/1979 through 6/30/2008 (Monthly)

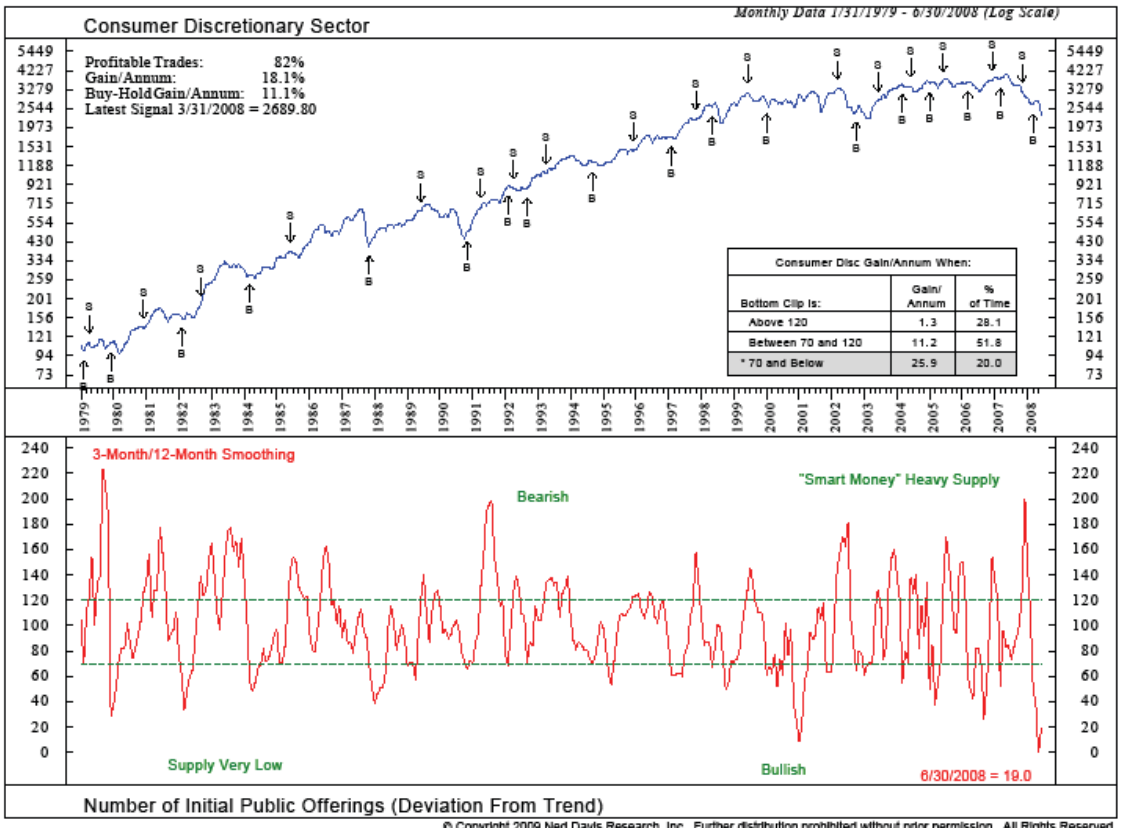
ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	12/31/1979	116.54	Sell	9/30/1980	143.32	22.98	274	12,298
Long	3/31/1982	132.88	Sell	12/31/1982	179.00	34.71	275	16,566
Long	3/31/1985	244.33	Sell	11/30/1985	270.72	10.80	244	18,355
Long	12/31/1987	316.49	Sell	6/30/1990	448.69	41.77	912	26,022
Long	10/31/1990	338.17	Sell	6/30/1991	473.30	39.96	242	36,421
Long	5/31/1995	799.27	Sell	12/31/1995	941.53	17.80	214	42,904
Long	1/31/1997	1173.95	Sell	6/30/1999	1732.85	47.61	880	63,330
Long	2/29/2000	1429.61	Sell	8/31/2000	1670.37	16.84	184	73,995
Long	3/31/2001	1595.50	Sell	8/31/2003	1590.18	-0.33	883	73,748
Long	3/31/2004	1779.80	Sell	6/30/2004	1890.31	6.21	91	78,327
Long	5/31/2005	1968.65	Sell	7/31/2005	2113.61	7.36	61	84,094
Long	12/31/2005	2185.19	Sell	11/30/2006	2481.27	13.55	334	95,488
Long	3/31/2007	2578.29	(Open)	6/30/2008	2326.02	-9.78	457	86,145

BATTING AVERAGE

	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	-0.33	1	-0.33		
GAINS	259.59	11	23.60		
N e t	259.25	12	21.60	4594	19.64

RESULTS OF ALL TRADES (Closed + Open)

$10,000 became $86,145 in 5051 days (13.84 years).
16.8% per annum compounded annually.



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Consumer Discretionary
SIGNAL ANALYSIS
DATES: 1/31/1979 through 6/30/2008 (Monthly)

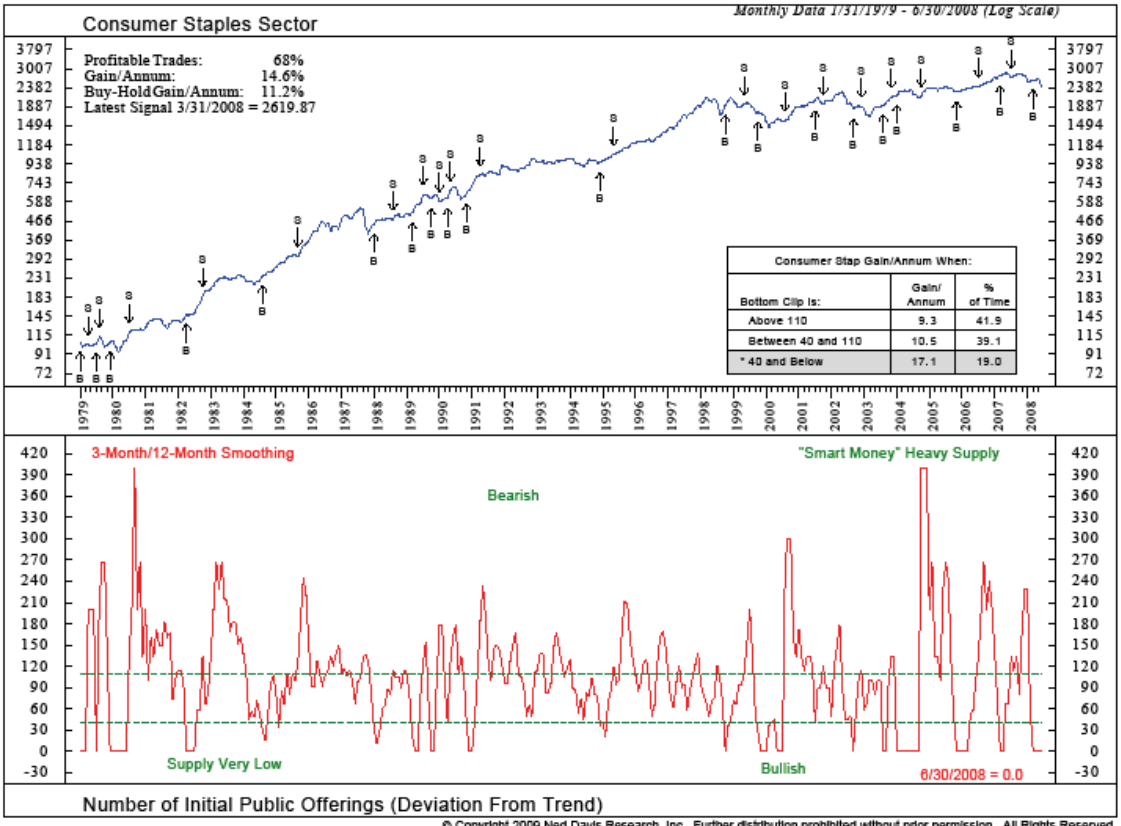
ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	2/28/1979	100.44	Sell	4/30/1979	111.05	10.56	61	11,056
Long	12/31/1979	111.03	Sell	12/31/1980	136.18	22.66	366	13,562
Long	2/28/1982	154.68	Sell	9/30/1982	183.28	18.49	214	16,069
Long	3/31/1984	277.97	Sell	6/30/1985	375.85	35.21	456	21,727
Long	11/30/1987	405.51	Sell	6/30/1989	643.49	58.69	578	34,478
Long	11/30/1990	490.99	Sell	4/30/1991	677.76	38.04	151	47,593
Long	2/29/1992	907.33	Sell	4/30/1992	872.19	-3.87	61	45,750
Long	9/30/1992	882.15	Sell	4/30/1993	1068.92	21.17	212	55,435
Long	9/30/1994	1241.49	Sell	12/31/1995	1446.27	16.49	457	64,579
Long	2/28/1997	1742.85	Sell	11/30/1997	2209.07	26.75	275	81,854
Long	5/31/1998	2614.12	Sell	6/30/1999	3135.41	19.94	395	98,177
Long	1/31/2000	2711.41	Sell	3/31/2002	3308.48	22.02	790	119,796
Long	10/31/2002	2424.79	Sell	6/30/2003	2804.16	15.65	242	138,539
Long	3/31/2004	3509.81	Sell	6/30/2004	3393.81	-3.30	91	133,960
Long	1/31/2005	3573.56	Sell	6/30/2005	3653.57	2.24	150	136,960
Long	3/31/2006	3650.42	Sell	12/31/2006	3732.26	2.24	275	140,030
Long	3/31/2007	3796.50	Sell	11/30/2007	3175.00	-16.37	244	117,107
Long	3/31/2008	2689.80	(Open)	6/30/2008	2348.05	-12.71	91	102,228

BATTING AVERAGE

	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	-23.55	3	-7.85		
GAINS	310.15	14	22.15		
N e t	286.60	17	16.86	5018	19.60

RESULTS OF ALL TRADES (Closed + Open)

$10,000 became $102,228 in 5109 days (14.00 years).
18.1% per annum compounded annually.



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Consumer Staples
SIGNAL ANALSYSIS
DATES: 1/31/1979 through 6/30/2008 (Monthly)

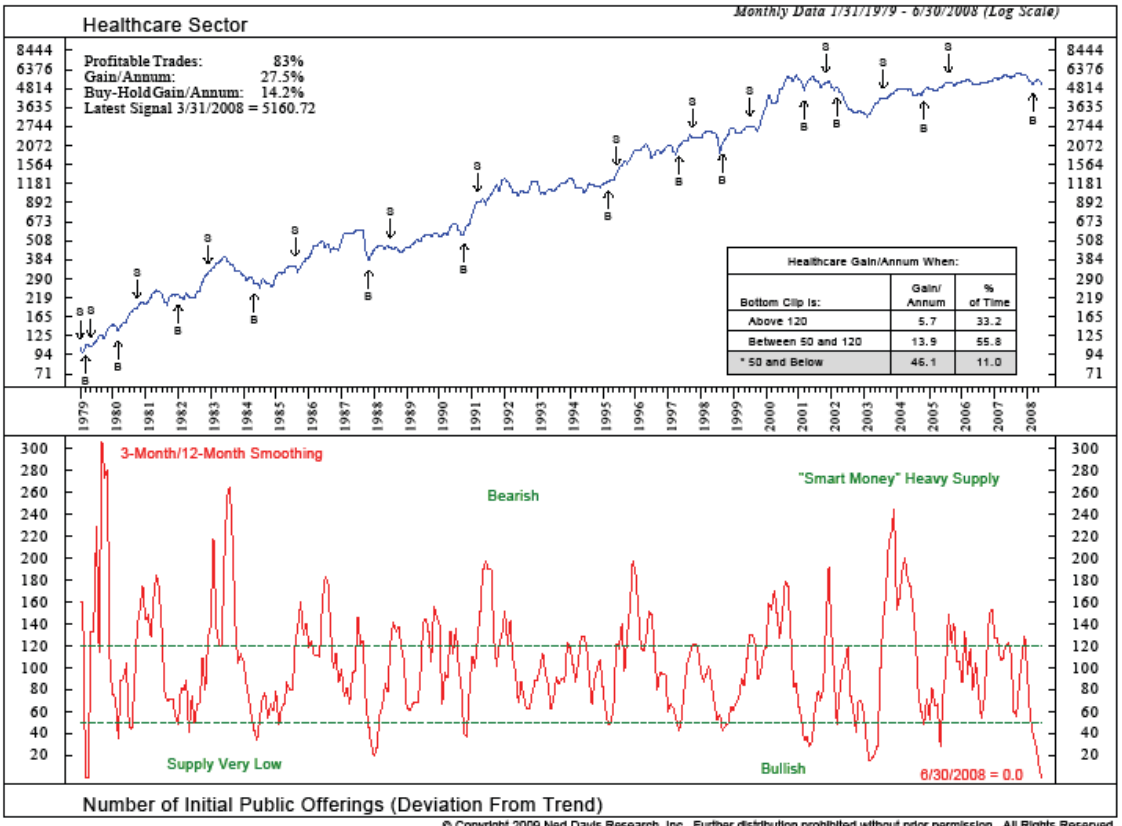
ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	1/31/1979	105.28	Sell	4/30/1979	102.36	-2.77	89	9,723
Long	7/31/1979	104.34	Sell	8/31/1979	112.72	8.03	31	10,504
Long	12/31/1979	105.56	Sell	7/31/1980	119.07	12.80	213	11,848
Long	4/30/1982	149.06	Sell	10/31/1982	185.56	24.49	184	14,750
Long	8/31/1984	237.57	Sell	9/30/1985	301.41	26.87	395	18,713
Long	1/31/1988	447.03	Sell	8/31/1988	470.71	5.30	213	19,705
Long	3/31/1989	515.05	Sell	7/31/1989	642.18	24.68	122	24,568
Long	10/31/1989	611.93	Sell	1/31/1990	592.24	-3.22	92	23,778
Long	4/30/1990	614.03	Sell	5/31/1990	676.40	10.16	31	26,193
Long	11/30/1990	648.46	Sell	4/30/1991	815.40	25.74	151	32,936
Long	12/31/1994	953.35	Sell	5/31/1995	1047.34	9.86	151	36,183
Long	10/31/1998	1922.31	Sell	5/31/1999	1939.71	0.91	212	36,510
Long	10/31/1999	1760.03	Sell	8/31/2000	1589.09	-9.71	305	32,964
Long	7/31/2001	2033.17	Sell	10/31/2001	1940.64	-4.55	92	31,464
Long	9/30/2002	1835.71	Sell	12/31/2002	1883.05	2.58	92	32,276
Long	8/31/2003	1931.03	Sell	11/30/2003	2113.78	9.46	91	35,330
Long	1/31/2004	2173.87	Sell	10/31/2004	2142.80	-1.43	274	34,825
Long	11/30/2005	2271.35	Sell	7/31/2006	2406.10	5.93	243	36,891
Long	3/31/2007	2761.46	Sell	7/31/2007	2688.43	-2.64	122	35,915
Long	3/31/2008	2619.87	(Open)	6/30/2008	2398.30	-8.46	91	32,878

BATTING AVERAGE

	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	-24.33	6	-4.05		
GAINS	166.81	13	12.83		
N e t	142.49	19	7.50	3103	16.23

RESULTS OF ALL TRADES (Closed + Open)

$10,000 became $32,878 in 3194 days (8.75 years).
14.6% per annum compounded annually.



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Healthcare
SIGNAL ANALYSIS
DATES: 1/31/1979 through 6/30/2008 (Monthly)

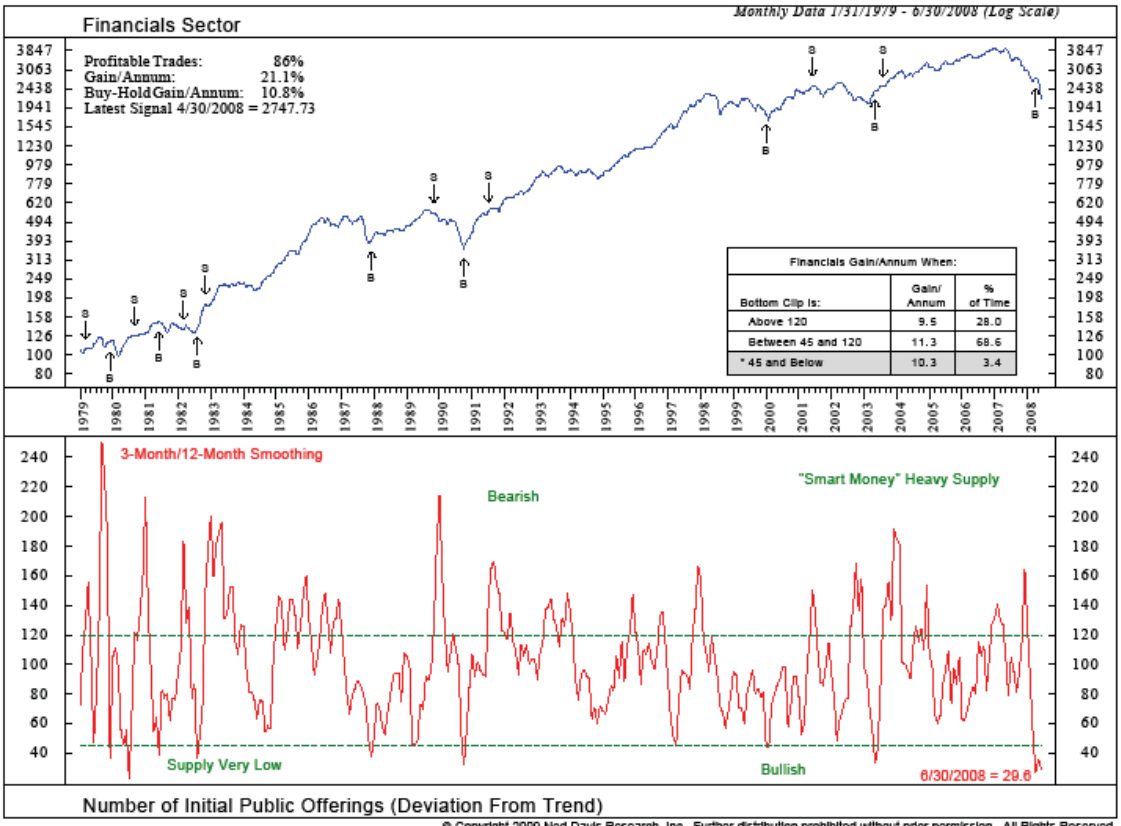
ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	3/31/1979	108.14	Sell	5/31/1979	106.12	-1.86	61	9,814
Long	3/31/1980	134.49	Sell	10/31/1980	187.78	39.62	214	13,702
Long	1/31/1982	229.68	Sell	12/31/1982	311.08	35.44	334	18,558
Long	5/31/1984	268.85	Sell	8/31/1985	348.33	29.56	457	24,044
Long	11/30/1987	381.40	Sell	7/31/1988	458.15	20.12	244	28,883
Long	10/31/1990	563.59	Sell	3/31/1991	909.95	61.46	151	46,633
Long	3/31/1995	1228.91	Sell	6/30/1995	1338.09	8.88	91	50,776
Long	5/31/1997	2053.36	Sell	10/31/1997	2333.65	13.65	153	57,708
Long	9/30/1998	2127.37	Sell	7/31/1999	2759.95	29.74	304	74,867
Long	3/31/2001	4678.75	Sell	11/30/2001	5243.49	12.07	244	83,904
Long	3/31/2002	4885.88	Sell	8/31/2003	4155.37	-14.95	518	71,359
Long	11/30/2004	4606.75	Sell	8/31/2005	5234.81	13.63	274	81,087
Long	3/31/2008	5160.72	(Open)	6/30/2008	5138.36	-0.43	91	80,736

BATTING AVERAGE

	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	-16.81	2	-8.41		
GAINS	264.18	10	26.42		
N e t	247.36	12	20.61	3045	28.52

RESULTS OF ALL TRADES (Closed + Open)

$10,000 became $80,736 in 3136 days (8.59 years).
27.5% per annum compounded annually.



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Financials
SIGNAL ANALYSIS
DATES: 1/31/1979 through 6/30/2008 (Monthly)

ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	12/31/1979	117.13	Sell	9/30/1980	126.36	7.88	274	10,788
Long	6/30/1981	149.33	Sell	3/31/1982	136.03	-8.91	274	9,827
Long	8/31/1982	139.33	Sell	11/30/1982	184.01	32.07	91	12,979
Long	12/31/1987	390.29	Sell	11/30/1989	547.85	40.37	700	18,219
Long	10/31/1990	357.94	Sell	7/31/1991	557.00	55.61	273	28,351
Long	1/31/2000	1796.93	Sell	6/30/2001	2521.99	40.35	516	39,790
Long	5/31/2003	2388.53	Sell	8/31/2003	2501.82	4.74	92	41,677
Long	4/30/2008	2747.73	(Open)	6/30/2008	2176.27	-20.80	61	33,009

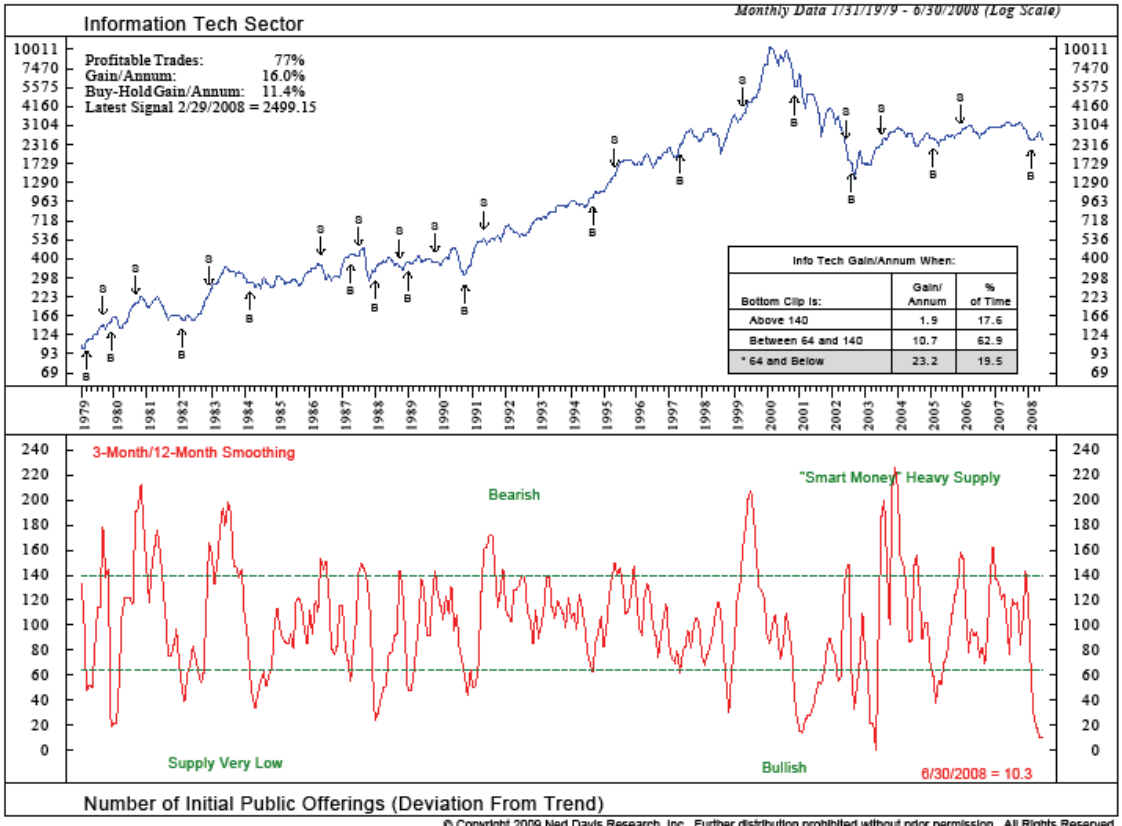
BATTING AVERAGE

	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	-8.91	1	-8.91		
GAINS	181.03	6	30.17		
N e t	172.12	7	24.59	2220	26.45

RESULTS OF ALL TRADES (Closed + Open)

$10,000 became $33,009 in 2281 days (6.25 years).
21.1% per annum compounded annually.

*NOTE: Accelerated crash in Financials significantly effected mark to market close of open trade and mode analysis performance. Risk management may reduce losses.



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Information Technology
SIGNAL ANALYSIS

DATES: 1/31/1979 through 6/30/2008 (Monthly)

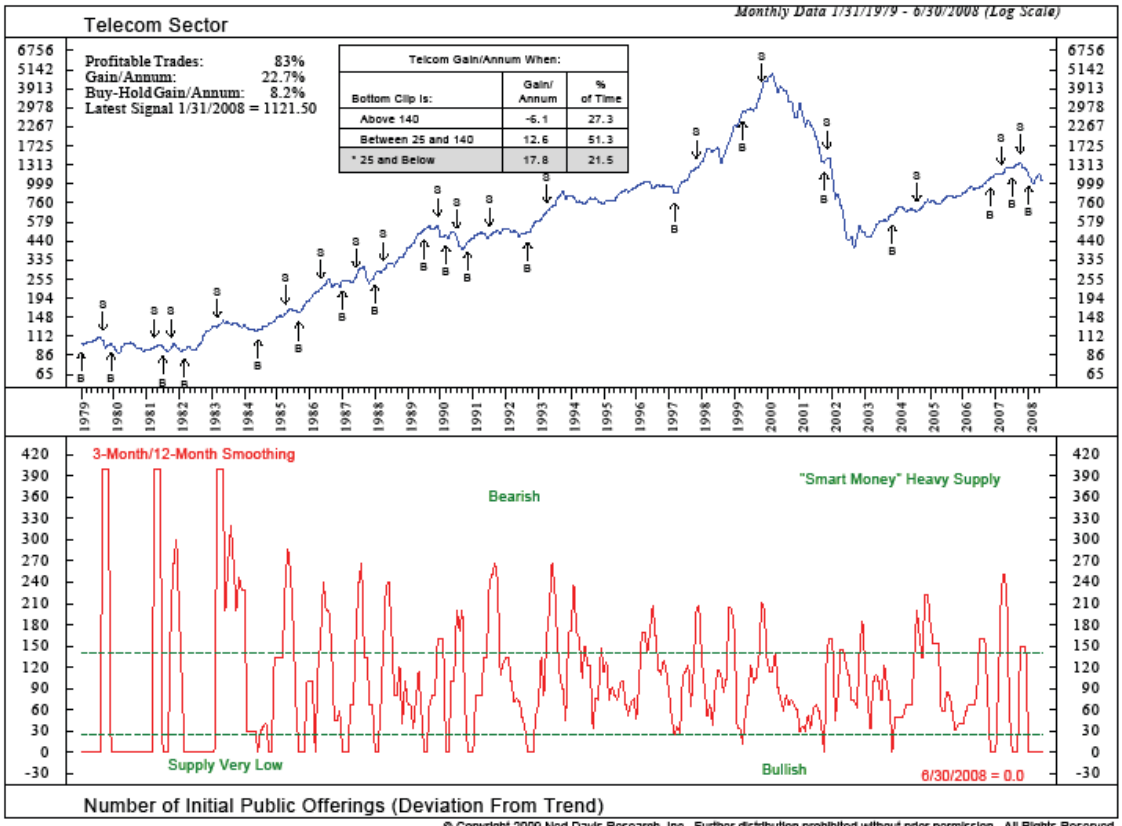
ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	3/31/1979	113.73	Sell	9/30/1979	144.49	27.05	183	12,705
Long	12/31/1979	150.79	Sell	9/30/1980	200.28	32.82	274	16,874
Long	2/28/1982	158.83	Sell	12/31/1982	228.61	43.93	306	24,288
Long	3/31/1984	279.47	Sell	5/31/1986	365.72	30.86	791	31,783
Long	4/30/1987	426.97	Sell	7/31/1987	421.35	-1.32	92	31,364
Long	1/31/1988	331.11	Sell	10/31/1988	349.94	5.69	274	33,148
Long	1/31/1989	382.26	Sell	11/30/1989	379.69	-0.67	303	32,925
Long	10/31/1990	312.77	Sell	5/31/1991	541.67	73.19	212	57,023
Long	9/30/1994	1035.22	Sell	5/31/1995	1418.96	37.07	243	78,160
Long	5/31/1997	2310.17	Sell	4/30/1999	3581.65	55.04	699	121,177
Long	11/30/2000	5703.39	Sell	6/30/2002	2185.70	-61.68	577	46,439
Long	8/31/2002	1740.64	Sell	7/31/2003	2342.98	34.60	334	62,508
Long	2/28/2005	2557.84	Sell	12/31/2005	2748.01	7.43	306	67,156
Long	2/29/2008	2499.15	(Open)	6/30/2008	2523.75	0.98	122	67,817

BATTING AVERAGE

	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	-63.67	3	-21.22		
GAINS	347.68	10	34.77		
N e t	284.01	13	21.85	4594	16.34

RESULTS OF ALL TRADES (Closed + Open)

$10,000 became $67,817 in 4716 days (12.92 years).
16.0% per annum compounded annually.



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Telecommunications Services
SIGNAL ANALYSIS

DATES: 1/31/1979 through 6/30/2008 (Monthly)

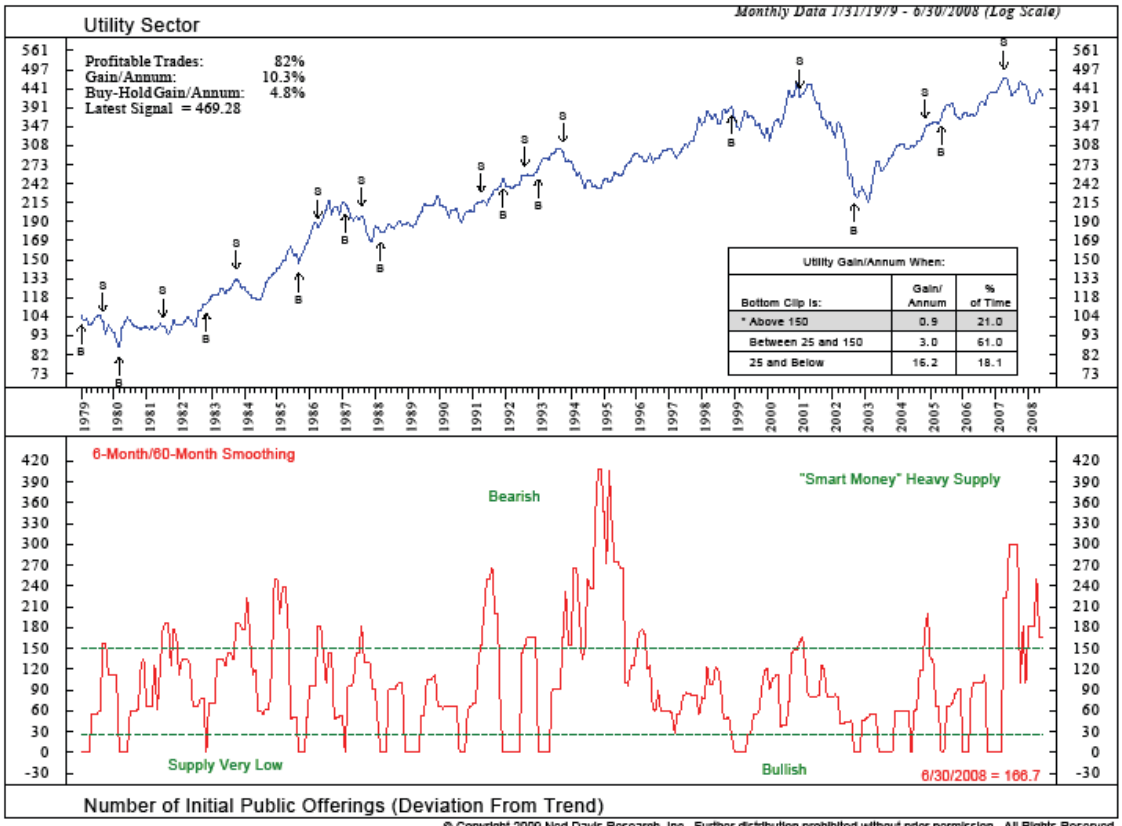
ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	1/31/1979	102.28	Sell	9/30/1979	106.24	3.87	242	10,387
Long	12/31/1979	102.17	Sell	4/30/1981	96.27	-5.77	486	9,788
Long	7/31/1981	97.40	Sell	10/31/1981	96.15	-1.28	92	9,663
Long	3/31/1982	93.31	Sell	3/31/1983	127.79	36.95	365	13,233
Long	6/30/1984	123.23	Sell	4/30/1985	155.01	25.79	304	16,645
Long	9/30/1985	159.61	Sell	5/31/1986	223.40	39.97	243	23,298
Long	1/31/1987	249.38	Sell	6/30/1987	262.20	5.14	150	24,496
Long	1/31/1988	270.96	Sell	4/30/1988	289.21	6.73	90	26,145
Long	7/31/1989	514.90	Sell	12/31/1989	544.54	5.76	153	27,650
Long	3/31/1990	475.91	Sell	7/31/1990	458.87	-3.58	122	26,660
Long	11/30/1990	433.57	Sell	7/31/1991	474.75	9.50	243	29,193
Long	9/30/1992	500.47	Sell	4/30/1993	658.56	31.59	212	38,414
Long	3/31/1997	880.41	Sell	11/30/1997	1255.28	42.58	244	54,770
Long	4/30/1999	2830.23	Sell	11/30/1999	3755.36	32.69	214	72,673
Long	10/31/2001	1357.29	Sell	11/30/2001	1431.64	5.48	30	76,655
Long	11/30/2003	637.08	Sell	8/31/2004	673.56	5.73	275	81,045
Long	11/30/2006	1085.03	Sell	3/31/2007	1145.15	5.54	121	85,536
Long	7/31/2007	1252.55	Sell	10/31/2007	1343.66	7.27	92	91,757
Long	1/31/2008	1121.50	(Open)	6/30/2008	1043.93	-6.92	151	85,410

BATTING AVERAGE

	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	-10.63	3	-3.54		
GAINS	264.58	15	17.64		
N e t	253.95	18	14.11	3678	24.60

RESULTS OF ALL TRADES (Closed + Open)

$10,000 became $85,410 in 3829 days (10.49 years).
22.7% per annum compounded annually.



© Copyright 2009 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/.

MARKET SECTOR: Utilities
SIGNAL ANALYSIS

DATES: 1/31/1979 through 6/30/2008 (Monthly)

ACTION	DATE	PRICE	ACTION	DATE	PRICE	PROFIT%	DAYS	$10,000
Long	1/31/1979	105.41	Sell	9/30/1979	101.63	-3.59	242	9,641
Long	3/31/1980	86.00	Sell	7/31/1981	97.96	13.91	487	10,982
Long	11/30/1982	113.40	Sell	10/31/1983	132.63	16.95	335	12,844
Long	9/30/1985	146.23	Sell	4/30/1986	183.01	25.16	212	16,075
Long	2/28/1987	211.94	Sell	8/31/1987	197.28	-6.92	184	14,963
Long	3/31/1988	177.71	Sell	4/30/1991	216.07	21.58	1125	18,192
Long	12/31/1991	249.31	Sell	8/31/1992	254.47	2.07	244	18,569
Long	1/31/1993	264.88	Sell	10/31/1993	295.73	11.65	273	20,732
Long	12/31/1998	394.93	Sell	1/31/2001	416.59	5.48	762	21,869
Long	9/30/2002	226.63	Sell	11/30/2004	344.37	51.95	792	33,231
Long	5/31/2005	369.80	Sell	4/30/2007	469.28	26.90	699	42,170

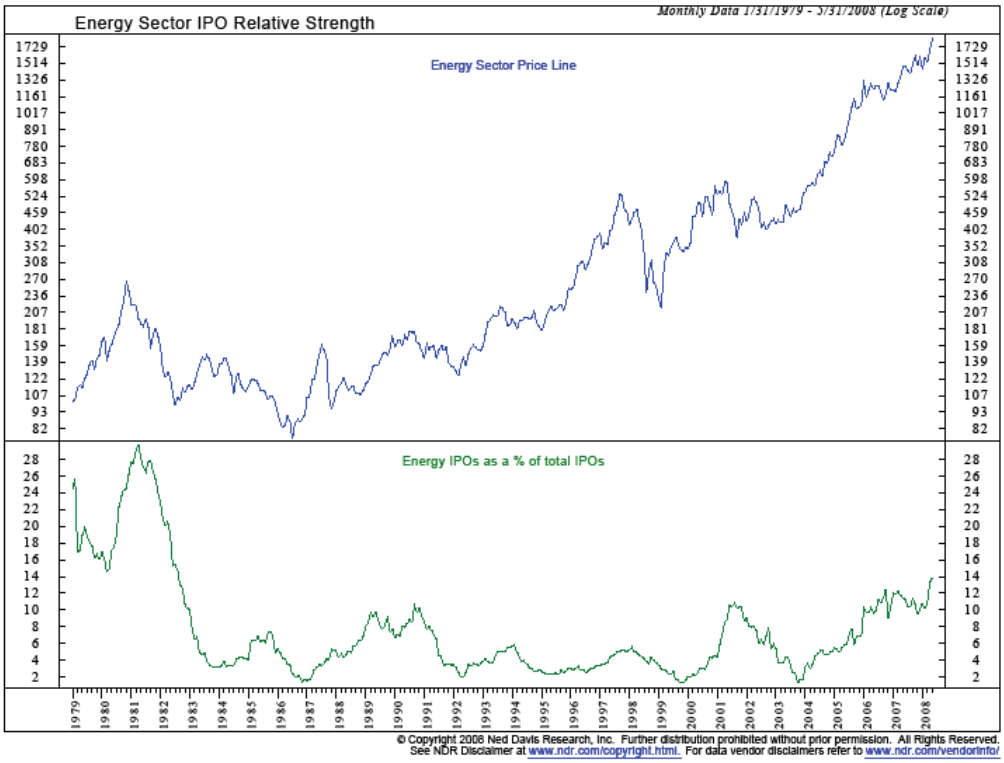
BATTING AVERAGE

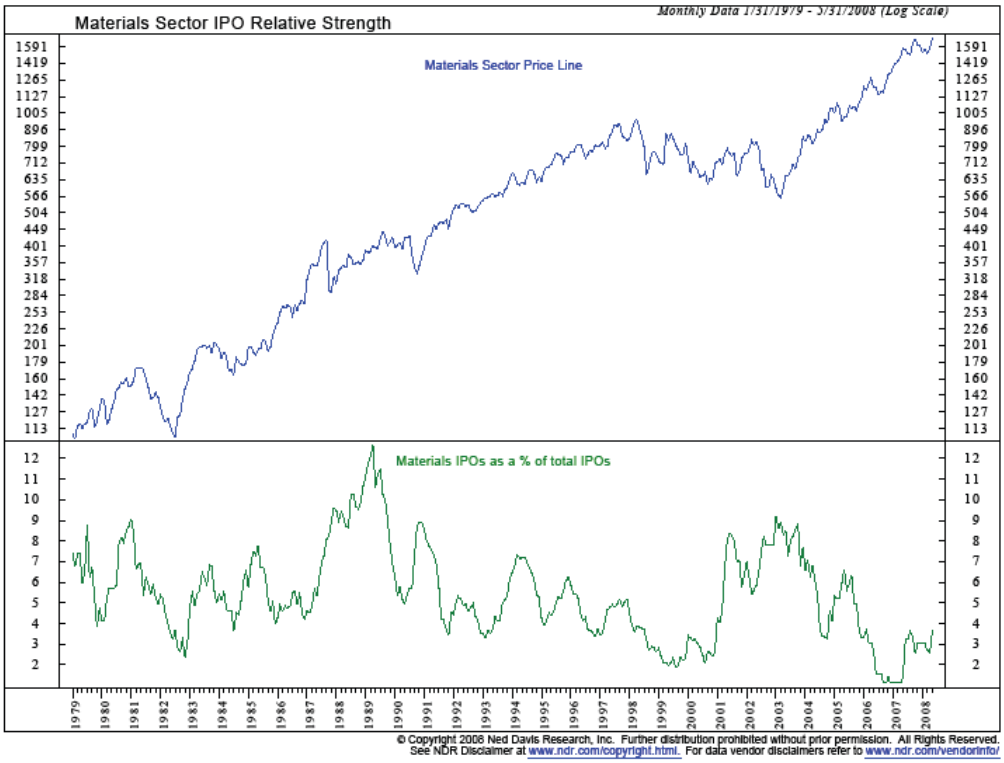
	Total Profit	Number Trades	Profit/ Trade	Number Days	Profit/ Annum
LONG					
LOSSES	-10.50	2	-5.25		
GAINS	175.65	9	19.52		
N e t	165.15	11	15.01	5355	10.31

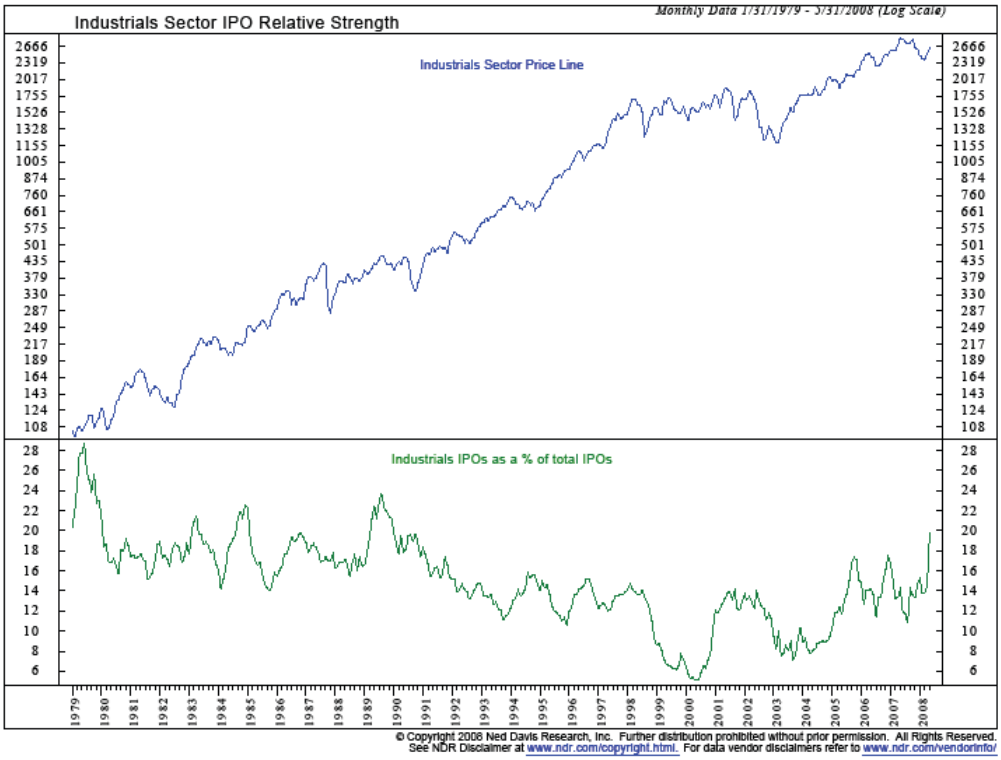
RESULTS OF ALL TRADES (Closed + Open)

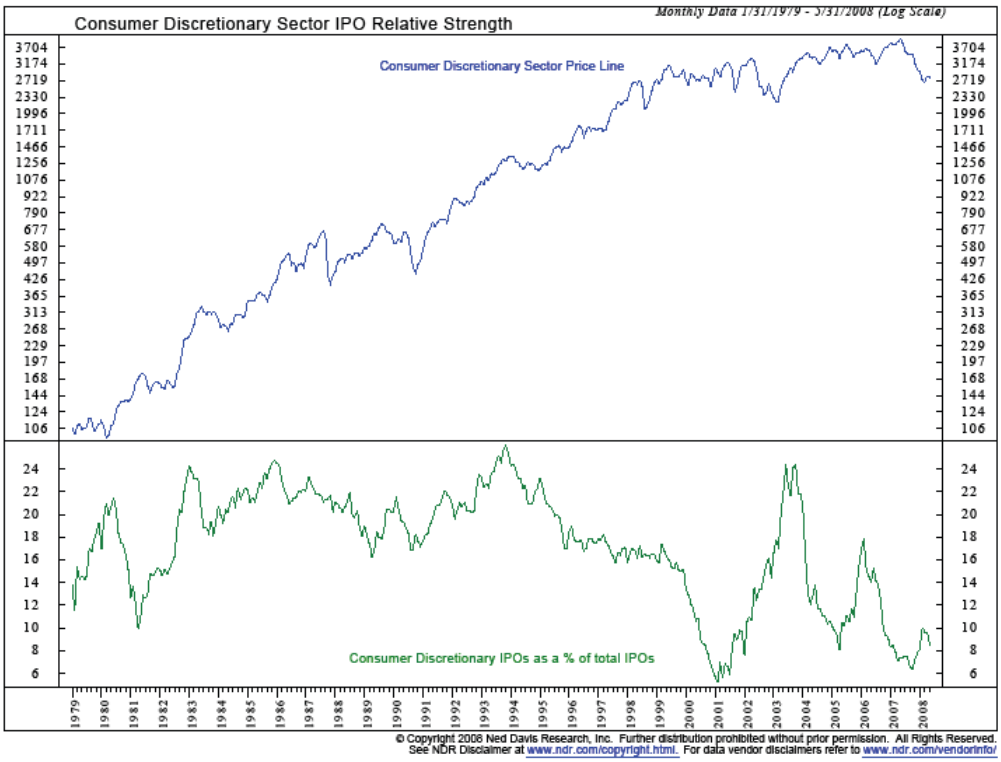
$10,000 became $42,170 in 5355 days (14.67 years).
10.3% per annum compounded annually.

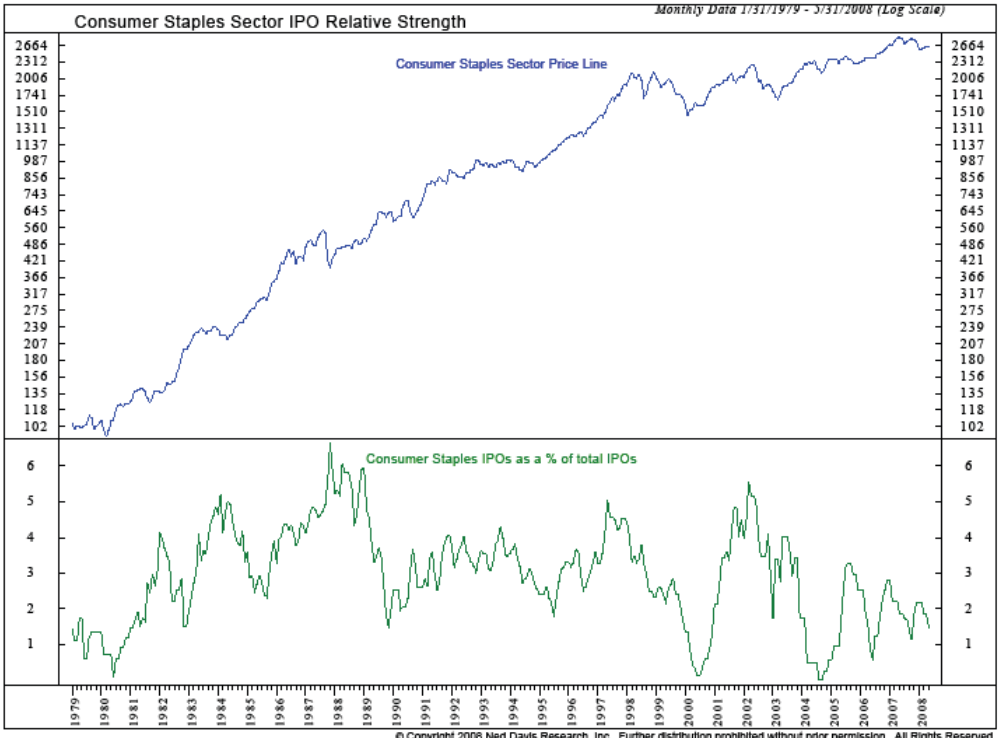
Appendix B

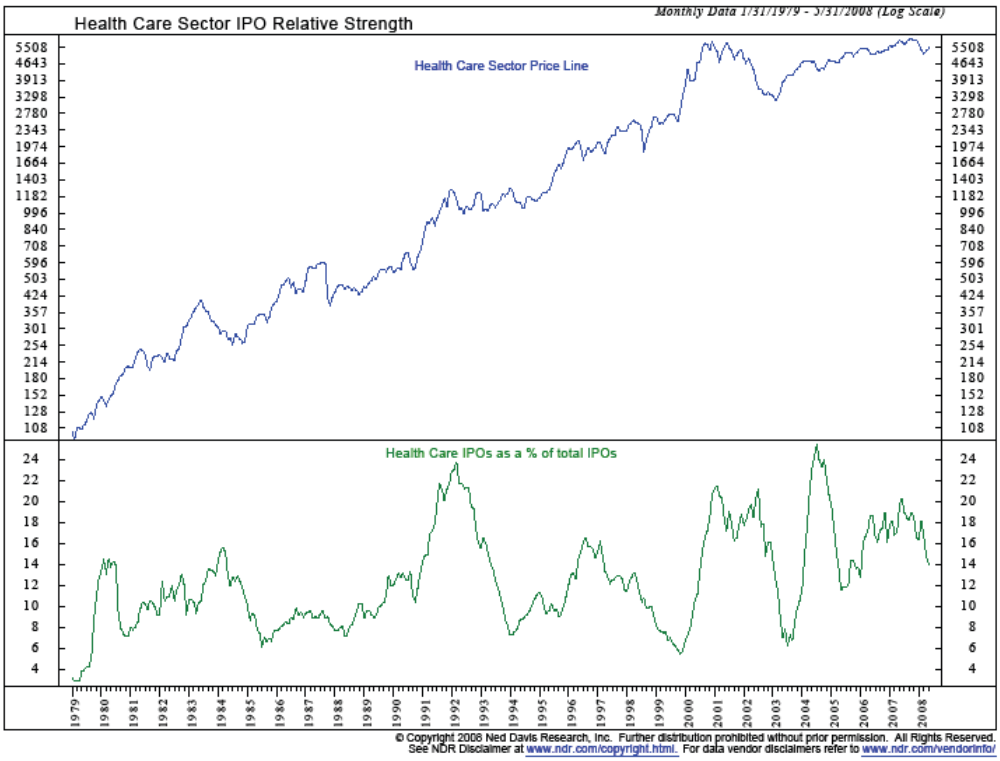

Energy Sector IPO Relative Strength
Monthly Data 1/31/1979 - 3/31/2008 (Log Scale)
Energy Sector Price Line
Energy IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/

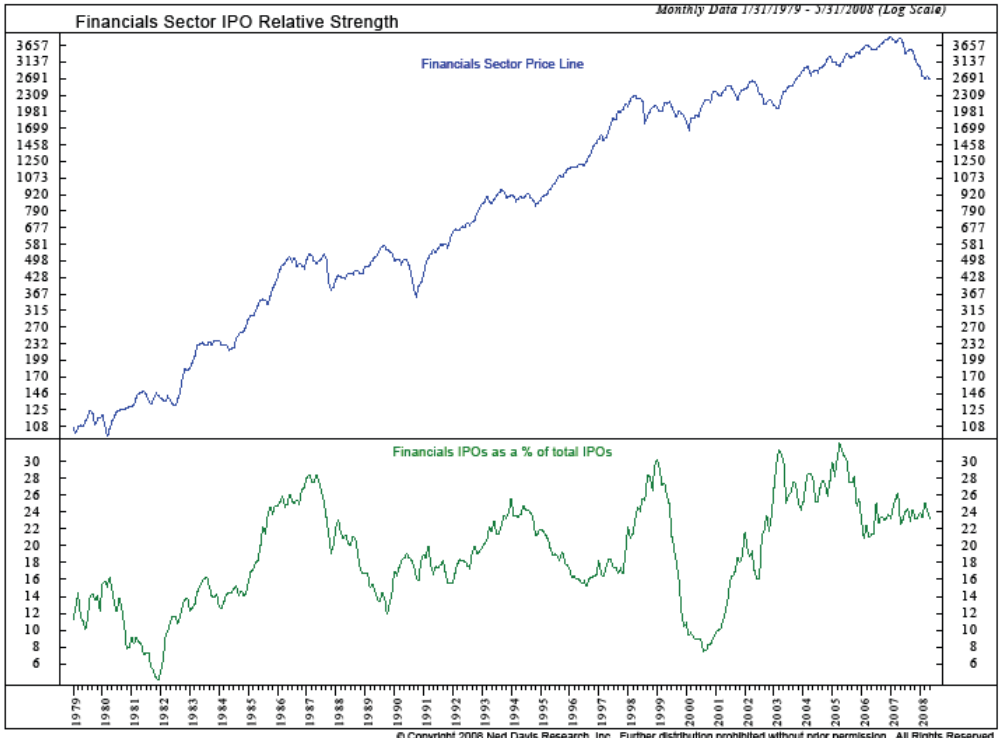

Materials Sector IPO Relative Strength
Monthly Data 1/31/1979 - 3/31/2008 (Log Scale)
Materials Sector Price Line
Materials IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/

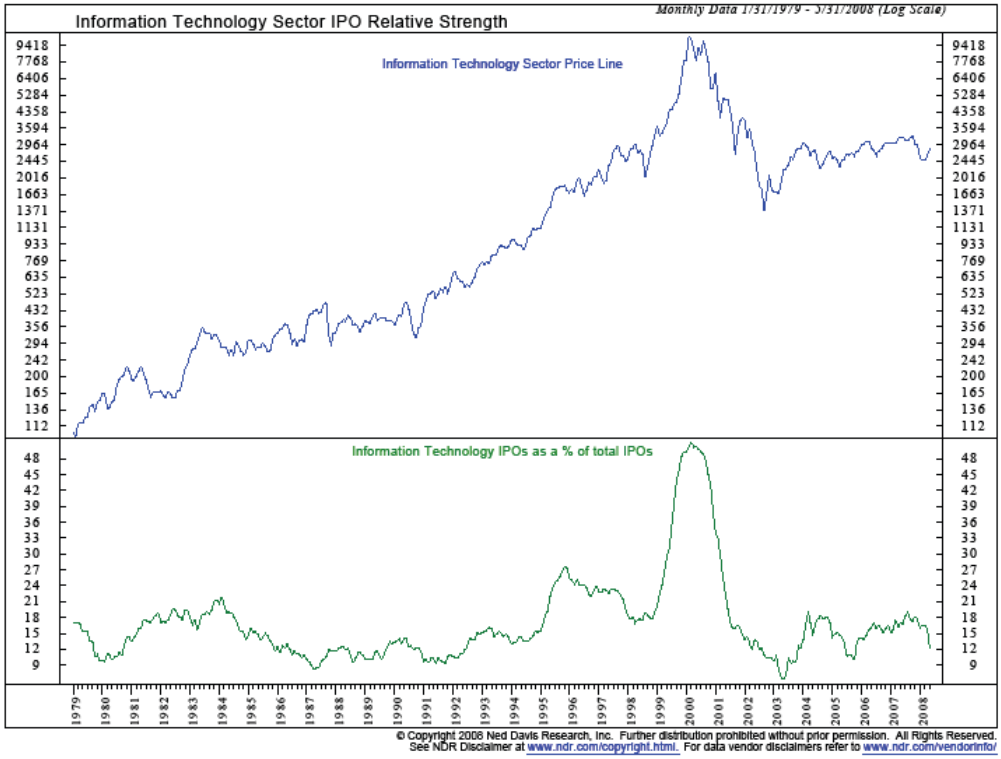

Industrials Sector IPO Relative Strength
Monthly Data 1/31/1979 - 5/31/2008 (Log Scale)
Industrials Sector Price Line
Industrials IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/

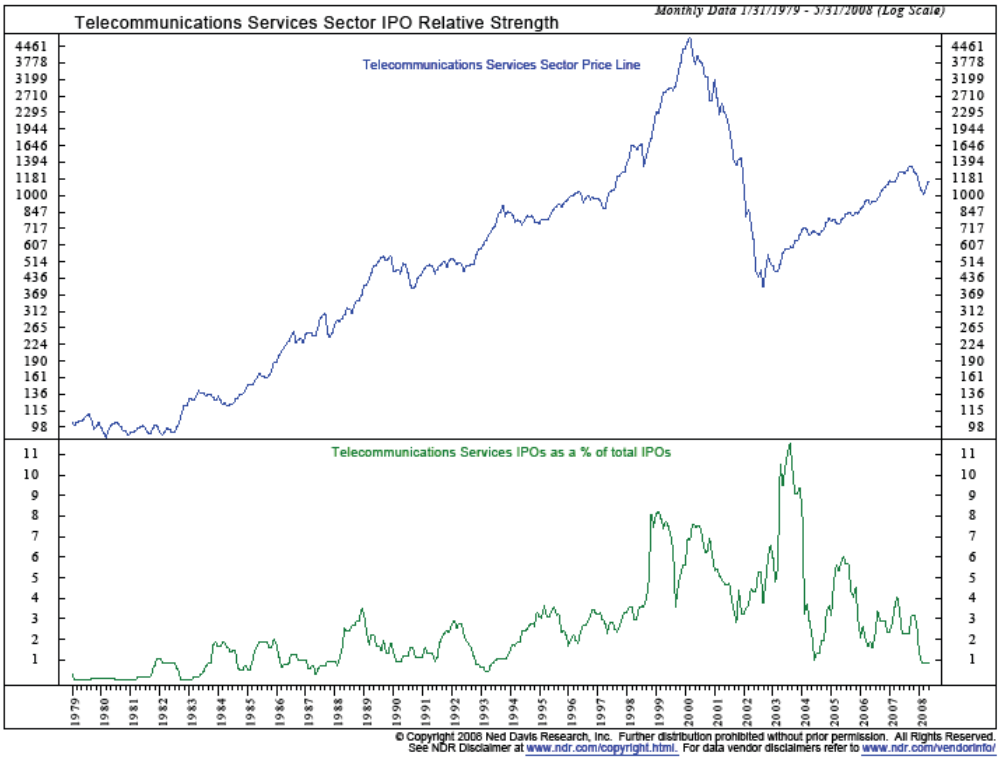

Consumer Discretionary Sector IPO Relative Strength
Monthly Data 1/31/1979 - 5/31/2008 (Log Scale)
Consumer Discretionary Sector Price Line
Consumer Discretionary IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/

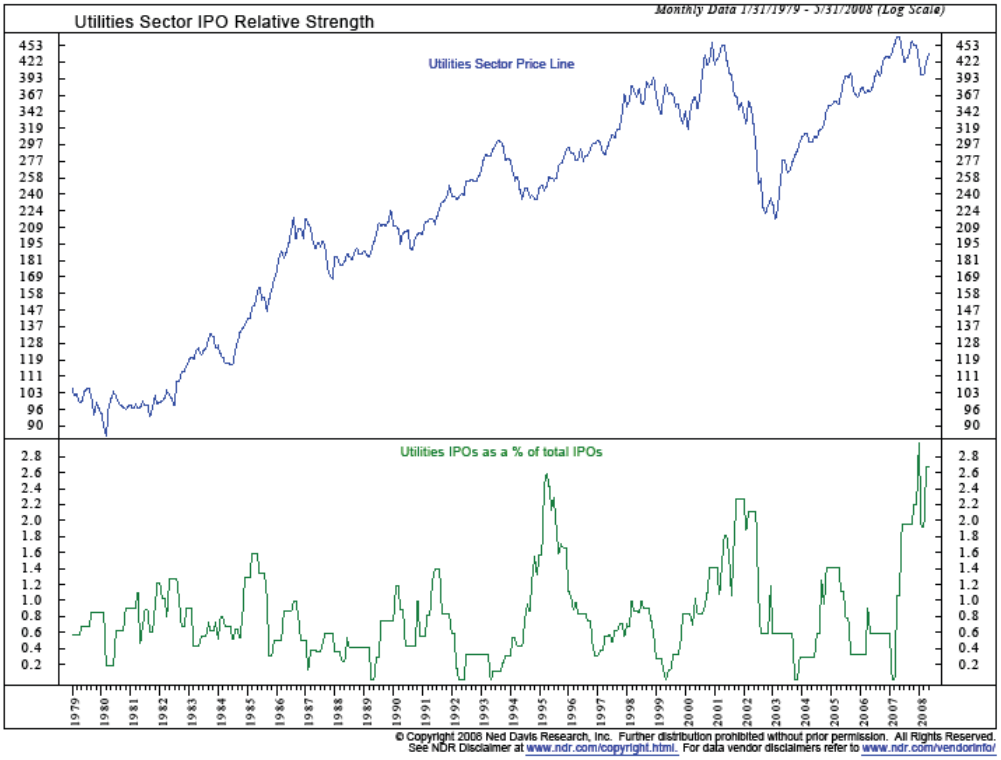

Consumer Staples Sector IPO Relative Strength
Monthly Data 1/31/1979 - 5/31/2008 (Log Scale)
Consumer Staples Sector Price Line
Consumer Staples IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/


Health Care Sector IPO Relative Strength
Monthly Data 1/31/1979 - 5/31/2008 (Log Scale)
Health Care Sector Price Line
Health Care IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/


Financials Sector IPO Relative Strength
Monthly Data 1/31/1979 - 5/31/2008 (Log Scale)
Financials Sector Price Line
Financials IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/


Information Technology Sector IPO Relative Strength
Monthly Data 1/31/1979 - 5/31/2008 (Log Scale)
Information Technology Sector Price Line
Information Technology IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/


Telecommunications Services Sector IPO Relative Strength
Monthly Data 1/31/1979 - 5/31/2008 (Log Scale)
Telecommunications Services Sector Price Line
Telecommunications Services IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/


Utilities Sector IPO Relative Strength
Monthly Data 1/31/1979 - 5/31/2008 (Log Scale)
Utilities Sector Price Line
Utilities IPOs as a % of total IPOs
© Copyright 2008 Ned Davis Research, Inc. Further distribution prohibited without prior permission. All Rights Reserved.
See NDR Disclaimer at www.ndr.com/copyright.html. For data vendor disclaimers refer to www.ndr.com/vendorinfo/

Appendix C – Example Bracket Analysis/Optimization Results

Deviation from Trend and Bracket Parameter	Gain Per Long	Gain Average
DTS 4 9,BR 64.00 132.00	12.89	42.86
DTS 4 9,BR 64.00 133.00	12.85	42.86
DTS 4 9,BR 64.00 134.00	12.85	42.86
DTS 4 10,BR 62.00 131.00	12.83	42.86
DTS 4 10,BR 62.00 134.00	16.39	42.86
DTS 4 10,BR 62.00 135.00	16.39	42.86
DTS 4 9,BR 65.00 132.00	12.43	42.86
DTS 4 9,BR 65.00 133.00	12.38	42.86
DTS 4 9,BR 65.00 134.00	12.38	42.86
DTS 1 5,BR 40.00 146.00	12.69	33.33
DTS 1 5,BR 40.00 147.00	12.69	33.33
DTS 1 5,BR 40.00 148.00	12.69	33.33
DTS 1 5,BR 40.00 149.00	12.69	33.33

About the Author

Kevin Lapham, CMT
Data Integrity Manager

Ned Davis Research
600 Bird Bay Drive West
Venice, FL 34285
941-412-2382

CYCLES The Mysterious Forces That Trigger Events

Edward R. Dewey, founder of The Foundation of the Study of Cycles,
with Og Mandino

5

Reprint: Chapter 8, (pages 92-107) The Cycle of Prices

Every time you make a major purchase you are, at least partially, trying to forecast the future price of that item.

Should you buy that new home now, or wait for real-estate prices to go down? Of course, they might go up. Should you trade your automobile now, or will you get a better price deal in December? Corporations try to anticipate the moment when their new bond issue will bring the best possible price.

Prices are affected by many forces, such as inflation, war, supply and demand, devaluation of currency, price controls, and changes in tariff laws. But underlying all these obvious and well-known causes is the mysterious and imposing force called rhythm.

Since World War II, prices have incessantly climbed to higher and higher plateaus, but even in their relentless upward movement they bob up and down in a behavior pattern that gives evidence of rhythm. They fluctuate, for the most part, in cycles, and this strange behavior seemingly has nothing to do with supply and demand, inflation, or any other well-known economic forces.

What if, while driving "blind" and backward, unable to see what is approaching, you suddenly realize that your road has a *pattern*? Wouldn't it be amazing if you discovered that it has *structure* and, insofar as this structure can be learned, the coming bends of the road are *predictable*?

Cycles have this structure, and although we still have much to learn, they can be used now to help us make forecasts. And regardless of how good or how practical the forecasts may be, the wondrous thing is that *from internal evidence alone* they can be made at all! We will improve our results as we learn more about our mystery and its cause.

Joseph, in biblical times, predicted a cycle of seven fat years followed by seven lean years, and the Pharaoh followed his advice to store up surplus food during the years of plenty so that there would be ample food during the years of shortage. After Joseph, the world waited several thousand years before another man was to come along and point out cycles in commodities and their prices. The Pharaoh listened to Joseph. The world has yet to heed the words of Samuel Brenner. Joseph, presumably, had rare gifts of prophecy. Brenner had only figures, graphs, and charts. [Editor's Note: Please see Issue 65, 2008, *Journal of Technical Analysis* where a chapter of Brenner's original work was reprinted.]

The Prophet from Bainbridge

Samuel Turner Benner was born at Bloom Furnace, Ohio, in 1832. As a youth he worked in his father's iron works and after his Civil War service he married a senator's daughter, Ellen Salts, and became a prosperous hog and corn farmer in Bainbridge, Ohio.

In 1873 he suffered two setbacks over which he had no control. Hog cholera and the 1873 panic drove Sam Benner into bankruptcy. Penniless, he accepted help from his father-in-law, and with their only son, Stephen, the Benners moved to a farm in Dundas, Ohio, that had been placed in his wife's name.

Benner continued to farm, but now his mind was on other matters. He was determined to learn what caused panics, what caused the ups and downs in prices, and how to stay prosperous through good times and bad. In 1875, at the age of forty-three, he copyrighted his famous Prophecies, which were published under the title of *Benner's Prophecies of Future Ups and Downs in Prices*. Yearly thereafter he added postscripts and supplemental forecasts until 1907. He died in 1913 at the age of eighty-one, and someday history will proclaim him the father of cycle study in America, for he, like Leeuwenhoek with his microscope, opened up a completely new world of knowledge.

Leeuwenhoek's discovery of microbes did not benefit mankind until 200 years after his first observations. Hopefully the world is no longer on the same timetable, for we cannot afford to wait until 2075 to convert Benner's discoveries of 1875 into a force for good.

Benner's major contributions to the knowledge of cycles were in the price fluctuations of pig iron and corn. He discovered a nine-year cycle in pig-iron prices with high prices following a pattern of eight, nine, and ten years and then repeating, with lows following a pattern of nine, seven, and eleven years and then repeating (see Figure 26).

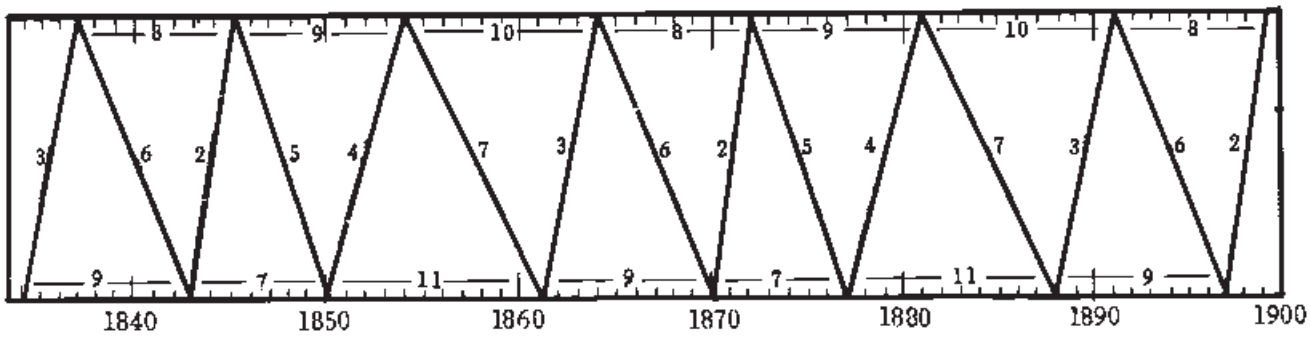
Had you traded pig iron from 1875 to 1935 on the basis of Benner's cycle you would have made forty-four times as much as you lost.

Since 1939 Benner's forecast has not fared well. The true length of the pig-iron prices, as we now know, is 9.2 years instead of nine years, and Benner admitted that he did not know how to deal with cycles of fractional length.

Gradually Benner's forecast got out of step with reality, but he never expected his original forecast, made in 1875, to hold true for more than twenty years. Were Benner still alive and issuing yearly supplements to his *Prophecies*, he probably would have learned all that was necessary to know about cycles of fractional length and would have adjusted later forecasts accordingly.

But we do not need to provide this great pioneer with any alibis. Benner's accurate forecast of pig-iron prices for nearly sixty years is the most notable forecast of prices in existence. He also discovered cycles in cotton, wheat, and pork prices, and a cycle in panics or depressions averaging eighteen years in length. I ask you to keep that length in mind as we explore our Foundation files for some other examples of cycles in various phenomena.

Figure 26. Benner's 9-Year Cycle in Pig-Iron Prices, 1834-1900.



This chart is based on the work of Samuel Benner, first published in 1876. It was so accurate in forecasting the pig-iron price cycle that it had a gain-loss ratio of 44 to 1 up to World War II.

The Fifty-Four-Year Cycle in European Wheat Prices

Cycles, November 1962—"One of the reasons that people believe in the reality and significance of the 54-year cycle is the fact that Lord Beveridge discovered a cycle of this length in his famous periodogram analysis of European wheat prices, 1500 to 1869.

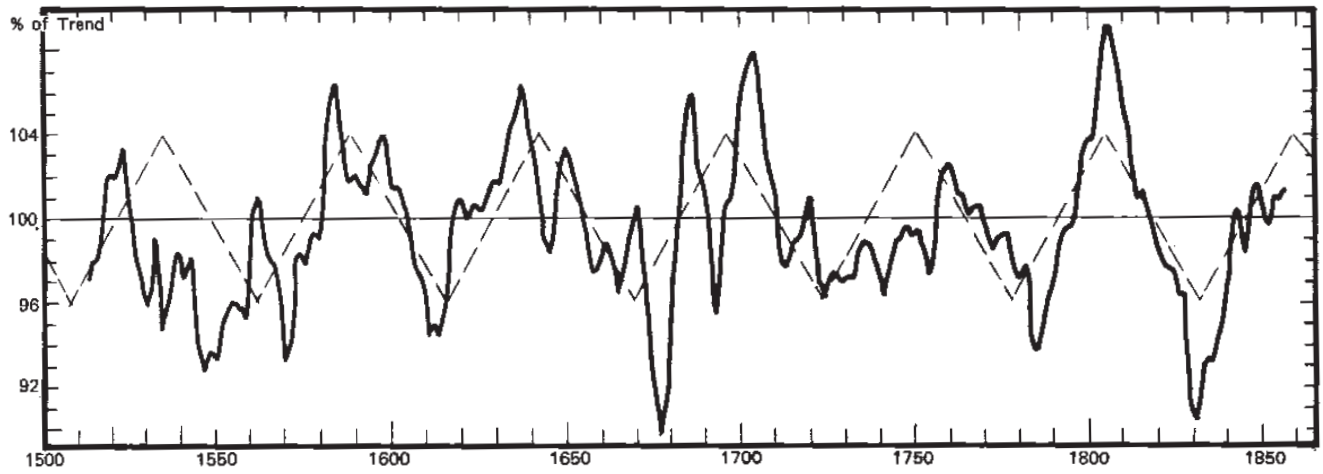
"...As so much of the belief in the significance of the 54-year cycle in all sorts of things depends upon this work of Lord Beveridge, I thought it desirable to examine his figures to see if there was a rhythmic cycle of this length actually present in his figures. I have done so. The result is shown [Figure 27]. Unquestionably, the figures do evidence a rhythm...the ups and downs do repeat time after time with a beat.

"...This does not mean that the crests and troughs come exactly 54 years from each other. The actual highs and lows are distorted, one way or another, by randoms and other cycles. There is, however, a tendency for areas of strength, weakness, etc., repeated time after time across the page. Fifty-four years is the length of the perfectly regular cycle that most nearly fits these various successive waves.

"...The 54-year cycle discovered by Lord Beveridge therefore is not a statistical abstraction; it does refer to a physical reality. It is a reality in the United States, also.

"...Wheat prices in England are readily available from 1259. These longer series of figures have also been studied, and the 54-year cycle persists throughout...adding even more credence to the significance and the permanence of this important cycle."

Figure 27. The 54-Year Cycle in European Wheat Prices, 1513-1856



Three months later I commented further about England's wheat-price cycle:

Cycles, February 1963—"Of course, it is not surprising that from 1500 to 1869 English and European wheat prices behaved more or less the same way, but my recent work adds new elements to the picture. First, in England, the wheat prices from 1500 to 1869 really had rhythmic waves, something that Beveridge's work had not gone far enough to show. Second, I discovered that the waves had continued *forward* from 1869 to 1940 and *backward* from 1500 to 1260! Lastly, over this much longer span of time the length really did seem to hold up very close to 54 years.

"I hope you realize what a very stupendous thing it is that a rhythm should persist in a price series for over 700 years. It is a mere 200 years after the Norman conquest and more than 400 years before the Industrial Revolution. Yet, over this long period of time...through wars, expansion, change from a feudal to a freehold agriculture and from a freehold agriculture to an industrial economy...the beat of 50 to 60 years has continued and has dominated.

"...A few years later, in 1949, studying some figures relative to the thickness and thinness of Arizona tree rings, I discovered that these figures, too, from 1100 to date, had what seemed to be a 54-year cycle. Here was something really important. If a natural science phenomenon like tree-ring widths has the same cycle as economic phenomena, we are on notice that we may be dealing with something much more fundamental than the mere ebb and flow of human price and production behavior."

In1926 N.D. Kondratieff, Director of the Conjuncture Institute of Moscow, published a paper that announced that throughout the Western world economic phenomena went up and down more or less together in oscillations that had been, for the last two or three waves, about a half-century long. His work posed questions whose answers we are still seeking. Why do economic affairs in all these divergent countries go up and down together? What is the cause?

The 3½–3¾-Year Cycle in Corn Prices

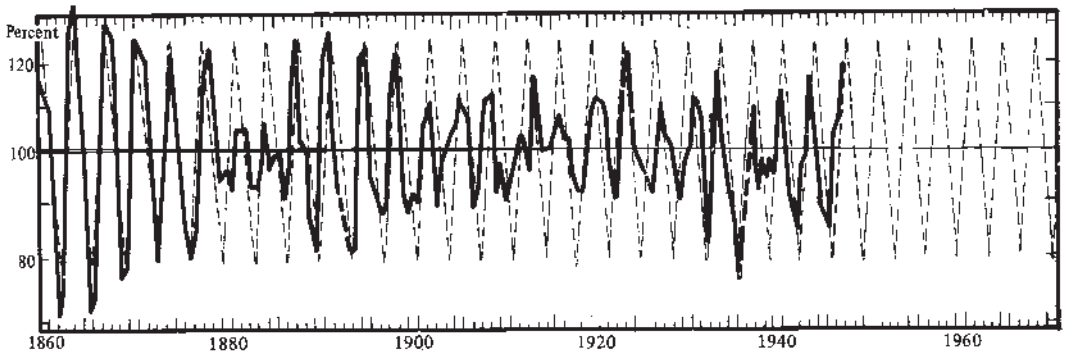
Cycles, October 1955—"With a few minor exceptions corn prices in America are available from 1720 to the present. [Prices prior to the Revolutionary War were converted from British shillings for this cycle study.]

"...There are a powerful lot of months from January, 1720, to December, 1954, 2,820 to be exact.

"...Even the most casual study of a chart of corn prices, 1720 to date, shows evidence of a cycle a little less than four years long which repeats time after time with reasonable regularity."

This cycle has behaved in a unique manner since 1720, a behavior not calculated to make our job any easier. It changes its rhythm! After two 4¾-year waves it averaged 3⅔-years from top to top for twenty-five repetitions, until 1826. Then it shortened its beat to 3½-years for five repetitions, until 1826. Then it shortened its beat to 3½-years for five repetitions. Then, just as suddenly, its length became 4½-years for four repetitions to 1860. From 1860 it has settled down to a regular 3½-years (see Figure 28) for twenty-five repetitions.

Figure 28. The 3½-Year Cycle in Corn Prices, 1860 – 1948



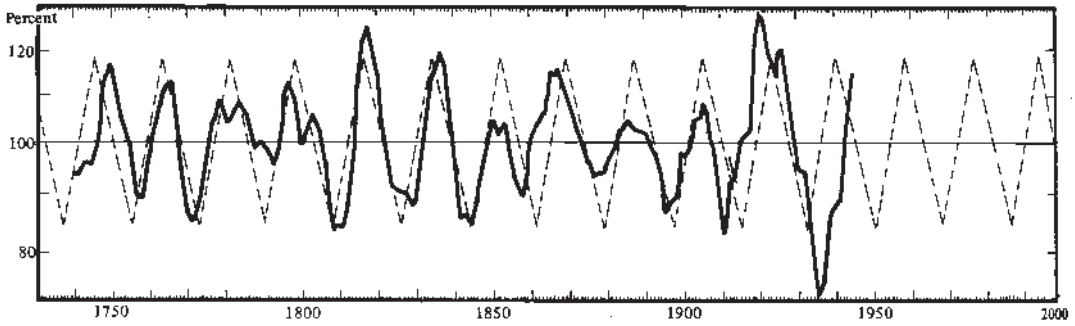
Neither the early cycle of 3⅔-years, repeating for ninety-two years, nor the recent cycle of 3½-years, repeating for the past ninety-five years, behaved with such amazing regularity purely by chance. But what force caused the cadence to change?

The 17¾-Year Cycle in Cotton Prices

Cycles, January 1955–"Cotton prices for over 220 years have been characterized by a rhythmic cycle about 17¾ years in length [see Figure 29].

"...You must not think this cycle (or any other cycle) in terms of its ideal crest. Think of it rather in terms of *areas* of strength and *areas* of weakness.

Figure 29. The 17¾-Year Cycle in Cotton Prices, 1740-1945



"...In the past we have had 21 tops and bottoms...15 came on time or within 2 years of perfect timing, 4 came 3 years one way or the other of perfect timing, 1 was 4 years off and 1 was 5 years off.

"...Let me remind you, again, that the 17¾-year cycle in cotton prices is only one of many cycles present in these figures. It's like shortening in a pie crust, important as an ingredient in a forecast, but by itself it doesn't taste very good. If, however, you combine the 17¾-year cycle in cotton with the 5.91-year cycle in these figures, you can expect results better than by using either alone. If you add in more cycles, you could hope for an even better forecast."

I hope you took special note of the previous paragraph. It is included in the original 1955 article for a special reason. In it, and for the first time in this book, you are being put on notice that many phenomena have more than one cycle length and act as if they were influenced simultaneously by more than one cyclic force.

The 16⅔-Year Cycle in English Wrought-Iron Prices

Cycles, May 1955 and July 1967-- "Wrought iron prices in England 1288 to 1908, clearly evidence a cycle about 16⅔ years in length [see Figure 30]. The figures cover a long enough period of time to that the cycle has repeated 38 times during 642 years.

"...When a rhythmic cycle persists in spite of changed environmental conditions we have additional evidence that it is of a non-chance nature.

"...Note that this cycle has remained a constant characteristic of these figures from before the Industrial Revolution, through the Industrial Revolution, and up into the era of modern technology.

"...Except for a few abnormalities scattered here and there over the 642-year period, the conformation to the perfectly regular pattern is quite astonishing."

Study this chart carefully. You will note that although the cycle was distorted on more than one occasion the pattern always reasserted itself in step with previous behavior, an important clue that the cycle is much more likely to be nonchance or significant.

The 17¾-Year Cycle in Pig-Iron Prices

Cycles, April 1955—"Pig iron prices, 1784 to date, have been characterized by a rhythmic cycle about 17.7 years long [see Figure 31]. The span of time for which data are available (171 years) is enough fir nine-and-a-half repetitions of the cycle.

"...Pig iron prices act as if they were influenced by a number of cyclic forces."

Figure 30. The 16⅔-Year Cycle in English Wrought-Iron Prices, 1288-1908.

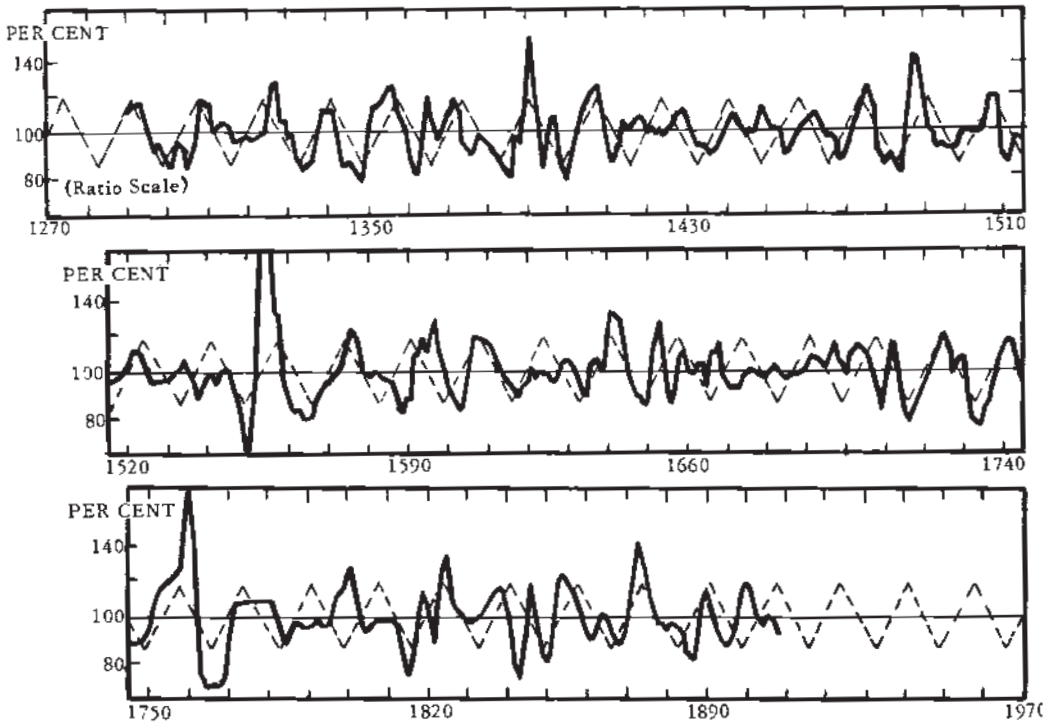
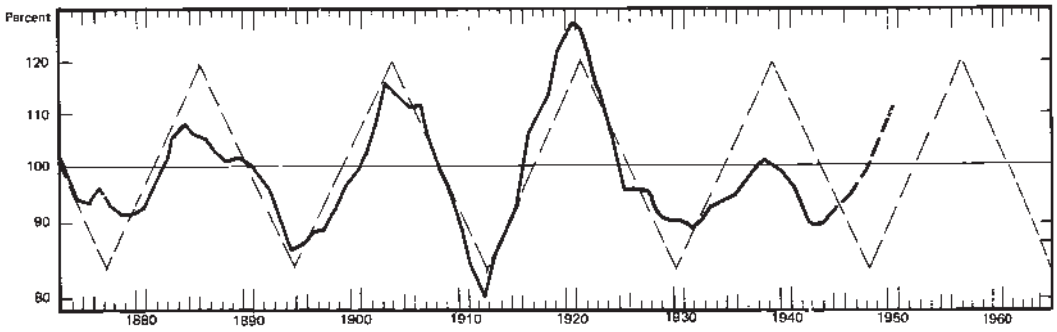


Figure 31. The 17¾-Year Cycle in Pig Iron Prices, 1872-1950



Two Strange Facts of Life

Why are there different cycle lengths in different things? Why, for example, does the price of cotton have a 17¾-year cycle while corn prices fluctuate in a 3½-year rhythm?

The answer is simple. No one knows!

For that matter, no one knows why strawberries respond to red light waves, plums to blue light waves, and bananas to yellow light waves. All three colors are equally available but strawberries, plums, and bananas are selective. So are wheat prices, cotton prices, corn prices, and all the other phenomena that respond to cyclic forces. Most stock prices, as you will discover in the next chapter, fluctuate independently of one another, just as various organs in your body have distinct and different rhythms. For now we can only accept this difference in cycle lengths as a fact of life just as we accept the sunrise and the sunset.

But there is another fact of cycle life that is even more perplexing. *Nearly every phenomenon seems to have more than one cycle, as if it were being influenced by a number of different forces, all acting on it at the same time.*

As you have learned, corn prices have a 3½-year cycle. But they also have longer 5½-year fluctuation that was discovered long ago by Samuel Benner.

Cotton prices have longer price cycles of fifty-four years and thirty-seven years and they have shorter cycles of 12.8 years, eleven years. 8.5 years and six years. There are possibly others, and it is this complexity of rhythms, all going up and down with different beats. [Editor's note: see cover] That causes all but the shortest hearts to abandon the search for the cause of cycles and go off in pursuit of something less difficult, like the fountain of youth or the lost continent of Atlantis.

And yet this concept will be easy for you to grasp when we consider weather as a perfect example of something with many cycles. Let's take the amount of rainfall in Anyplace, U.S.A. If we analyze the record of rainfall in this mythical city over a period of many years we will discover many cycles. The first of these is the yearly cycle. Some months have less rainfall than others and there is a normally dry season and a normally wet season.

Next, consider that some years as a *whole* are drier than others. If the dry years and wet years alternate we would also have a two-year cycle.

Now, the records of rainfall at Anyplace might indicate that, on the average, every other decade was drier than the one in between. This would give us a twenty-year cycle. And some centuries might be, on the average, drier than others – a 200-year cycle.

In our hypothetical case your dry periods from one-tear, two-year, twenty-year, and 200-year cycles will all coi9ncide from time to time. There would be a dry month in a dryer than normal year in a drier than normal decade in a dryer than normal century. The opposite could also happen with all the wetter than normal periods coinciding.

Then there would be various mixtures of the wet and dry cycles. They might, at times, cancel each other out. At other times they might partially cancel each other out, and leave one or two cycles to dominate the scene. The situation would then become difficult to unravel with all the various cycles operating at the same time, reinforcing each other, canceling each other, and all mixed together in a seemingly unfathomable maze of ups and downs.

Yet this situation is not unfathomable. Once the different length cycles have been discovered and isolated, it is neither difficult nor complicated to combine them, through simple arithmetic, into a synthesis – one line representing the sum of all their different fluctuations and project this line into the future. Let's look at a fairly simple example from Cycles, September 1958, dealing with the price of oats.

In an earlier analysis, covering the price of No. 3 white oats at Chicago from January 1923 through May 1958, we had discovered a cycle of 26.64 months. An ideal cycle of this length is plotted in Figure 32 as A.

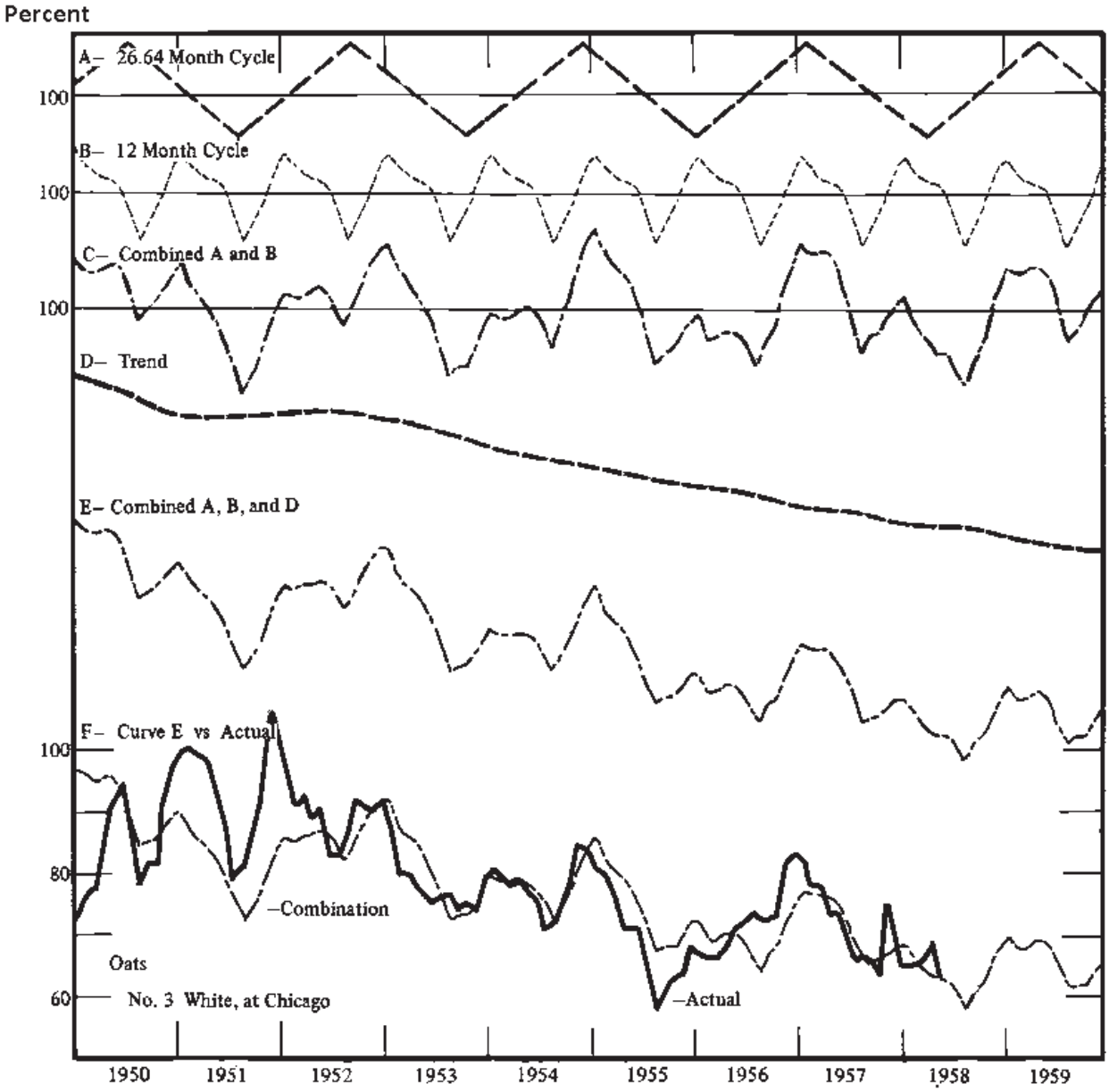
There is also a twelve-month seasonal cycle in oat prices. An ideal cycle of this length is plotted as B.

If we combine these two cycles, we have a curve (a line) that looks like C.

The general trend of oat prices during this period was downward, as you can see in D.

When we combine this downward trend with A and B, we have a line that looks like E. Line E is reproduced again at the very bottom of the graph, and a heavy line of the actual price of oats from 1950 through April 1958 is superimposed on it. As you can see, by using only cycles and the price trend line we did not come too far from the actual results. The variation between the two could have been caused by other unknown and still undiscovered cycles or randoms in the series of figures.

Figure 32. The Price of Oats, 1950 – 1959



Our dotted line (E) was also extended through 1959 as a forecast, assuming that the two cycles would continue and that the price of oats would continue in its downward trend. Of course, either of these conditions could change. The downward trend of oat prices might reverse itself, or our two cycles could be overcome by a stronger cycle of some other length, still unknown. There could be many still undiscovered cycles in the price of oats. The government could also intrude to tamper with oat prices. War might affect price. Thus if you were interested in oats, you would stick closely to your graphs, constantly making adjustments as Samuel Benner might have done with his yearly supplements.

This particular graph (in Figure 32) somewhat reminds me of Edison's early incandescent light. Many improvements and refinements will be made as our knowledge increases – but it does shed some light, dim as it may be, in the darkness. You can use the information even in its present far from absolute state provided you treat it only as a probability of what is to come, not as an absolute certainty.

...the late General Charles Gates Dawes, former Vice President of the United States, former chairman of the board of the City National Bank and Trust Company of Chicago, and until his death a member of the board of directors of the Foundation for the Study of Cycles, once told me that he and his brother made over a million dollars in the market solely as a result of his knowledge of cycles. He showed me brokerage statements that indicated more than this amount in clear profit.

Obviously he offered the best kind of proof that cycles can be a tremendously useful tool for the investor and businessman.

About the Author

Edward R. Dewey, founder of The Foundation of the Study of Cycles,
with Og Mandino
Copyright © 1971, Foundation of the Study of Cycles
Hawthorn Books, Inc., Publishers New York

The Organization of the Market Technicians Association, Inc.

MTA Affiliate

Affiliate status is available to individuals who are interested in technical analysis and the benefits that the MTA offers to its membership. To become an Affiliate, there is no professional requirement, but there is an annual commitment to the MTA Code of Ethics. Affiliates receive access to all the benefits the MTA provides, and can participate in the Chartered Market Technician (CMT) program, and once they become Members (See Member section), be awarded the CMT designation. Most importantly, membership with the MTA includes you in the vast network of MTA Members and Affiliates world wide, providing them common ground among fellow technicians.

MTA Member

Becoming a Member of the MTA requires extensive professional experience in technical analysis and an annual commitment to the MTA Code of Ethics. Member status is available to those "whose professional efforts are spent practicing financial technical analysis that is either made available to the investing public or becomes a primary input into an active portfolio management process or for whom technical analysis is a primary basis of their investment decision-making process." Applicants for Member status must be engaged in the above capacity for five years and must be sponsored by three current MTA Members. By becoming a Member, you have all the benefits offered to Affiliates, plus MTA Members can vote in MTA meetings, hold office or chair a committee, and can be eligible for the Chartered Market Technician (CMT) designation.

Dues

Dues for joining the MTA is $300, paid annually. All benefits of membership can be found on the mta.org website. For more information about MTA membership, and student membership discounts, please contact Marie Penza at marie@mta,org or 646-652-3300.

The Value of the CMT Designation

What is a CMT designation?

The Chartered Market Technician (CMT) designation is awarded to candidates who demonstrate proficiency in a broad range of technical analysis of the financial markets. It is made up of an educational component, an experience requirement, an ethics requirement, and a membership requirement. It is also the only examination for Technical Analysts that qualifies as a Series 86 exemption.

What is the CMT Program and what are its objectives?

The Chartered Market Technician (CMT) Program is a certification process in which candidates are required to demonstrate proficiency in a broad range of technical analysis subjects. Administered by the Accreditation Committee of the Market Technicians Association (MTA), Inc., the Program consists of three levels. Level 1 is a multiple choice exam; Level 2 is a multiple choice exam; Level 3, is the essay portion of the exam. The objectives of the CMT Program are:

- To guide candidates in mastering a professional body of knowledge and in developing analytical skills;
- To promote and encourage the highest standards of education; and
- To grant the right to use the professional designation of Chartered Market Technician (CMT) to those Members who successfully complete the Program and agree to abide by the MTA Code of Ethics.

How can I find out more information about the CMT Exam and designation?

For more information on the CMT Program, please visit our website at www.mta.org. On the tool bar at the top of the page there is a link to the "CMT Program" page. There is a lot of information on that page that will accurately describe the value of the CMT designation, and also answer many of the questions you might have. If you have any further questions on the CMT Program, please feel free to contact Marie Penza at Marie@mta.org or call any of our MTA headquarter staff at (646) 652-3300. We would be pleased to assist you in any way we can.

Why the CMT?

The CMT program offers a structured approach to study technical analysis and ensure all key areas are covered. The CMT can help to open doors that lead to job opportunities, and only the CMT demonstrates to Wall Street that you are a professional in the field of technical analysis. For those seeking a more traditional Wall Street analyst job, passing the first two CMT exams provides a significant step towards the Registered Research Analyst designation from FINRA. Even if you're not looking for a FINRA exemption but rather just to learn technical analysis, the CMT Program offers a structured, organized, and comprehensive way to do so.

2010 Charles H. Dow Award Competition Now Open!

Want to gain the recognition from your peers and the entire technical analysis community? Begin working on a research paper for the 2010 Charles H. Dow Award today!

The competition for the 2010 Charles H. Dow Award is now open. The Award, which is the most significant writing competition in the field of technical analysis today, has been awarded annually since 1994. The Award is given to the research paper which is judged to contribute creativity, innovative thought and professional presentation to the study of technical analysis. Past recipients of the Award are among the fields most notable market technicians.

The winning author will not only receive a ***cash prize of $5,000***, but will also be featured at a national MTA seminar or a MTA Chapter meeting to present the award winning paper. The paper, or a summary, may be published in the MTA's *Journal of Technical Analysis* and the MTA *Technically Speaking* e-newsletter, and posted on the MTA website (mta.org) and MTA Knowledge Base (knowledgebase.mta.org). At the discretion of the judging panel, the authors of runner-up papers will receive certificates as well. The competition is a great platform for serious technicians to receive recognition for their work in the field of technical analysis.

The last day to submit papers is February 1, 2010. The 2010 guidelines and copies of all winning papers are posted on the MTA website (click on Charles H. Dow Award under the Activities drop down). Submit inquiries to DowAward@mta.org.

Market Technicians Association, Inc.

Professionals Managing Market Risk • Incorporated in 1973

61 Broadway • Suite 514 • New York, NY 10006 • 646.652.3300 • www.mta.org